/R23

LIBRARY
DEC 1 1965
FISH & WILDLIFE SERVICE

Report of the Third Session

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH

Rome, 1-8 March 1965

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 1965

FAO FISHERIES REPORTS

A series of reports of meetings, surveys and other activities of FAO Fisheries Division. Other recent documents in this series published since January 1964 are:

FIb/R6.4		Proceedings of the world scientific meeting on the biology of tunas and related species, Vol. 4 - bibliography Actes de la réunion scientifique mondiale sur la biologie du thon et des espèces voisines, Vol. 4 - bibliographie Actas de la reunión científica mundial sobre biología del atún y especies afines, Vol. 4 - bibliografia	1964
FI/R12		Informe de la primera reunión de la comisión asesora regional de pesca para el Atlántico sud-occidental (CARPAS)	1964
FIe/R16		Report to the Government of Saudi Arabia on the organization of fisheries operations on the Red Sea Coast	1964
FIt/R17	(En)	Report of the FAO fishing vessel stability meeting, Gdansk, Poland, 7-14 October 1963	1964
FIt/R17	(Es)	Informe de la reunión de la FAO sobre estabilidad de los barcos pesqueros; Gdansk, Polonia: 7-14 octubre 1963	1964
FIb/R18	(En)	Report of the first session of the FAO expert panel for the facilitation of tuna research, Rome, 8-12 June 1964	1964
FIb/R18	(Fr)	Rapport de la première session du groupe d'experts FAO chargé de faciliter la recherche sur le thon, Rome, 8-12 juin 1964	1964
FIb/R18	(Es)	Informe del primer período de sesiones del cuadro de expertos de la FAO para la facilitación de las investigaciones sobre el atún, Roma, 8-12 junio 1964	1964
FIt/R19	(En)	Report of the symposium on the significance of fundamental research in the utilization of fish, Husum, Federal Republic of Germany, 26-30 May 1964	1964
FIb/R20	(En)	Report of the second session of the advisory committee on marine resources research, Rome, 6-12 February 1964	1964
FIe/R21	(En)	Report of the fourth session of the continuing working party on fishery statistics in the North Atlantic area, Rome, 9-12 March 1965	1965
FIe/R22.1	(En)	Report of the meeting on business decisions in fishery industries, Rome, 21-25 September 1964, Vol. 1 - Report	1965
FIb/R23	(En)	Report of the third session of the advisory committee on marine resources research, Rome, 1-8 March 1965	1965

Unserialized reports dated earlier than January 1962 and earlier documents in this series are listed in the FAO Catalogue of Fisheries Publications and Documents (1963). Certain unserialized reports may be reprinted in this series as the unserialized versions go out of print.

REPORT OF THE THIRD SESSION OF THE ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH

Rome, 1 - 8 March 1965

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, April 1965

25842/E

PREPARATION OF THIS REPORT

This is an edited and approved version of ACMRR/3/WP.22 as amended at the closing session of the Committee and which incorporates the conclusions of the ACMRR Working Party on Direct and Speedier Estimation of Fish Abundance (ACMRR/3/WP.18).

Distribution:

FAO Fisheries Division
FAO Regional Fisheries Officers
Members of ACMRR
FBCB Selector 5
Member Countries
IOC
Members of ACMRR Working Parties

"Current Bibliography" Entry:

ACMRR (FAO). Third Session, Rome, 9-12001 M 1-8 March 1965 (1965)
FAO Fish.Rep., (23):50 p.
Report of the third session of the Advisory Committee on Marine Resources Research.

Reports implementation of recommendations of the second session. Gives guide lines for future programs, Fisheries Division's program of work for 1966/67 and following biennia in the field of marine resources research and management, coordination and cooperation with other bodies, and matters on which the IOC has requested advice. Appends Director-General's opening address, statement by R.I. Jackson, Director of Fisheries, list of papers presented, list of participants, interaction between the world program of marine resources research and field activities for UNSF, remarks by the retiring chairman, Dr. A. Needler, and a statement by the representative of UNESCO/IOC, Dr. G. Hempel.

Pr 8-115me and 8-116me.

C O N T E N T S

		Page
I	GENERAL REPORT	1
1.	PROCEDURAL MATTERS	1
1.1	Opening Session	1
1.2	Adoption of the Agenda	2
1.3	Date and Place of Fourth Session	2
1.4	Election of officers for forthcoming period of activities	3
2.	IMPLEMENTATION OF RECOMMENDATIONS OF THE SECOND SESSION	3
3.	GUIDE LINES FOR FUTURE PROGRAMS	3
3.1	The Rôle of FAO in World Fishery Development	3
3.1.1.	Reaction of the FAO Fisheries Division's Regular Program on Marine Resources Research to Special Fund and EPTA Activities	4
3.2	World Program of Marine Resources Research	5
3.3	FAO Regional Fisheries Councils and Commissions (ACMRR/3/Rec.1)	5
3.4	Fisheries Aspects of Marine Pollution (ACMRR/3/Rec.2)	5
3.5	Tuna Investigations and Conservation	8
4.	FISHERIES DIVISION PROGRAM OF WORK FOR 1966/67 AND FOLLOWING BIENNIA IN THE FIELD OF MARINE RESOURCES RESEARCH AND MANAGEMENT	9
4.1	Intelligence on Current Activities	9
4.1.1	Current Bibliography for Aquatic Sciences and Fisheries and Related Activities (ACMRR/3/Rec.3)	9
4.1.2	"International Marine Science"	10
4.1.3	SCOR Working Group on Marine Science Abstracts and Bibliographies	10

		Page
4.2	Organization of Research, Education and Training	11
	4.2.1 Manuals and Study Tours (ACMRR/3/Rec.4)	11
	4.2.2 International Conference on Fisheries Administration	12
	4.2.3 Symposium on Fisheries Education at IPFC 12th Session (ACMRR/3/Rec.5)	12
	4.2.4 Training Centre on Marine Resources Assessment in Latin America	12
4.3	FAO Meetings	13
	4.3.1 World Scientific Meetings on the Biology of Species of Commercial Importance	13
	4.3.2 Symposium on Tropho-dynamics of Marine Communities (ACMRR/3/Rec.6)	13
	4.3.3 FAO Symposium on Fish Behaviour and Gear Research (ACMRR/3/Rec.7)	14
4.4	Development and Assistance in Stock Assessment	15
	4.4.1 FAO Fisheries Data Centre	15
	4.4.2 Statistics for Research Purposes (ACMRR/3/Rec.8)	15
	4.4.3 Direct and Speedier Estimation of Fish Abundance (ACMRR/3/Rec.9)	16
4.5	Environmental Studies	18
	4.5.1 Fisheries Oceanographic Synopses (ACMRR/3/Rec.10)	18
	4.5.2 Fishermen's Charts and Utilization of Synoptic Data (ACMRR/3/Rec.11)	19
	4.5.3 Booklets on Oceanography and Meteorology for Fishermen	19
4.6	Special Fisheries Chapter of SOFA	20
4.7	Species Synopses (ACMRR/3/Rec.12)	20

		Page
5.	CO-ORDINATION AND COOPERATION WITH OTHER BODIES	21
5.1	UN Specialized Agencies	21
5.2	Regional Fisheries Councils and Commissions	21
5.3	International Biological Program (ACMRR/3/Rec.13)	21
5.4	UNESCO First Seminar on the Oceanography of the South Pacific	22
6.	MATTERS ON WHICH THE INTER-GOVERNMENTAL OCEANOGRAPHIC COMMISSION HAS REQUESTED ADVICE	22
6.1	General Scientific Framework for World Ocean Study (ACMRR/3/Rec.14)	22
6.2	International Oceanographic Programs	23
6.2.1	International Indian Ocean Expedition - IIOE (ACMRR/3/Rec.15)	23
6.2.2	International Co-operative Investigations of Tropical Atlantic - ICITA - and the Guinean Trawling Survey - GTS (ACMRR/3/Rec.16)	24
6.2.3	South Atlantic Co-operative Investigations - SACI	25
6.2.4	Co-operative Study of Kuroshio - CSK (ACMRR/3/Rec.17)	25
6.2.5	Co-operative Study of the South Mediterranean - CSSM (ACMRR/3/Rec.18)	26
6.3	Exchange of Data and Information (ACMRR/3/Rec.19)	26
6.4	Second International Oceanographic Congress (ACMRR/3/Rec.20)	27
6.5	Development of National Programs	27
7.	OTHER MATTERS	27

II ANNEXES

ANNEX 1:	AGENDA	28
ANNEX 2:	DIRECTOR-GENERAL'S OPENING ADDRESS TO THE THIRD SESSION OF ACMRR	30
ANNEX 3:	OPENING STATEMENT BY MR. ROY. I. JACKSON, DIRECTOR OF FISHERIES DIVISION, TO THE THIRD SESSION OF ACMRR	33

		Page
ANNEX 4:	LIST OF INFORMATION PAPERS	36
ANNEX 5:	LIST OF WORKING PAPERS	38
ANNEX 6:	LIST OF PARTICIPANTS	40
ANNEX 7:	INTERACTION BETWEEN THE WORLD PROGRAM OF MARINE RESOURCES RESEARCH AND FIELD ACTIVITIES FOR UNSF	44
ANNEX 8:	REMARKS BY THE RETIRING CHAIRMAN, DR. A. NEEDLER	47
ANNEX 9:	STATEMENT BY THE REPRESENTATIVE OF UNESCO/IOC, DR. G. HEMPEL	48

I. GENERAL REPORT

1. PROCEDURAL MATTERS

1.1 Opening Session (Agenda Item 1)

The Chairman, Dr. A. Needler, introduced to the Director-General of FAO, Dr. B.R. Sen, the ACMRR members, members of its working parties and the representatives and observers of other international organizations attending the Third Session of the Committee.

In his address to the opening meeting [a/], Dr. Sen welcomed the members and expressed on behalf of the Committee deep sorrow at the recent death of Professor G.K. Izhevsky. He then thanked the Committee for the advice which it had given FAO in the previous years, which had helped him in defining the policy lines and structural changes needed for the Organization to play the leading international rôle in the field of marine resources research and utilization, which is expected by FAO member countries. In line with this advice he had made proposals to strengthen the Organization's fisheries activities, incorporating the establishment of a Permanent Committee on Fisheries, and the creation of a Department of Fisheries within the Organization. He stressed that these plans, if implemented, far from diminishing the significance of ACMRR's work, would extend its importance.

Dr. Sen showed how the situation in world fisheries is becoming more and more complex, requiring not only a rational planning for long-term development, but in some cases emergency action, as, for example, in regard to the Antarctic Whale stocks. It was inevitable that failure to secure rational exploitation in this single case could weaken also the international effort being developed for the purpose of managing resources of other kinds and in other regions. The need for intensive well-planned cooperation in obtaining scientific advice on which rational management and exploitation of stocks can be based, places increasing responsibility on existing regional fisheries bodies; creates the need for some new ones; demands the maximum of co-operation between FAO and individual international organizations, and requires active integrated contributions from the member countries. Cooperation between FAO, UNESCO and the IOC has been greatly extended during the past year and he noted with appreciation that the ACMRR has acted effectively as an advisory body to both organizations.

Dr. Sen indicated that further support for the FAO regional fisheries bodies is contemplated in the plan for the reorganization and strengthening of the fisheries activities of the Organization, and instanced the intention of FAO to develop a Fisheries Data Centre. He drew further attention to the part which he hoped the Advisory Committee (ACMRR) will play in advising FAO on a "World Program of Marine Resources Research", and in its promotion of means to make rapid surveys of resource distribution and potential yield, a project which the ECOSOC Advisory Committee on the Application of Science and Technology to Development considered to merit high priority.

Lastly, Dr. Sen mentioned that FAO intends to cooperate with UNESCO in sponsoring the Second International Oceanographic Congress and supporting the International Biological Programme; these are positive steps towards the goal of effective integrated action by both agencies, the consequences of which will be of benefit to member countries and to international science as a whole.

---

a/ See Annex 1.

In his remarks following the Director-General's opening speech [a], Mr. Roy I. Jackson, Director of the FAO Fisheries Division, also welcomed the Committee's members and observers, and paid tribute to the work accomplished by ACMRR, which he found of great value in preparing the proposals for the future activities, structure and rôle of FAO in the field of marine fisheries, in which he has been deeply engaged since he joined the Organization last May. Mr. Jackson emphasized the value of the continued advice and assistance given by ACMRR in the difficult task of making this plan concrete and in choosing priorities correctly. The Committee recognized this to be a crucial choice as regards the future of the Regular Program - on which the entire work depends - in the face of the very proper and increasing demands for servicing field operations under various forms of technical assistance on a massive scale. He expressed the view that field projects, and especially those under the UNSF, which are mainly national projects, must be developed in a broad international context, which will contribute to the effectiveness of each individual project.

Because of the expected expansion of staff and facilities, it would be possible to revise some fundamental aspects of the Regular Program: renewing the emphasis on population dynamics, and at the same time initiating important actions in relation to direct assessment methods which are of immense potential importance, especially to developing countries. These activities, of great importance to conservation and management problems, will be developed simultaneously with biological statistics and the FAO bibliographic and documentation services which are closely inter-related.

Mr. Jackson pointed out that marine pollution is another growing problem which, for the moment, does not seem to be so acute as the management of exploitation, but which nevertheless requires urgent action, to find the facts, to determine the trends and to consider what might be required, now or eventually, in ways of control. These aspects will be discussed at the request of FAO by the next session of the ACC Sub-Committee on Oceanography.

Finally, Mr. Jackson stated that the world program for the scientific appraisal of marine resources mentioned in the Director-General's speech would bring to reality a concept which has been basic to the work of the Division for many biennia; but it needs reorientation and a more detailed formulation.

1.2 Adoption of the Agenda (Agenda Item 1.2)

The Chairman submitted the Provisional Agenda for consideration, adding that the Secretariat had suggested the inclusion of a new item: 4.6 - Special Fisheries Chapter of SOFA for 1967. He also announced that Dr. N. Panikkar, Chairman of IOC, had requested that ACMRR consider IOC/III/Res.14 on "Development of National Programs" and submit its views on the subject to IOC.

The Committee approved the Agenda with these additional items included.

In order to facilitate and speed up the preparation of the report, the Chairman proposed and the Committee agreed to appoint Mr. B.B. Parrish as Assistant to the Rapporteur for the duration of this Session.

1.3 Date and Place of Fourth Session (Agenda Item 1.3)

After a general discussion of this item, it was agreed that a proposal should be formulated by the Chairman and Vice-Chairmen in consultation with the Secretariat, taking due regard of the dates of IOC sessions, the places and dates of SCOR sessions, and of the difficulties that might arise from convening the Committee at a place other than FAO Headquarters. It was suggested

---

a/ See Annex 2.

that consideration be given to the possibility of convening a special interim meeting of the Chairman and Vice-Chairmen and Secretariat at the time of the Second International Oceanographic Congress, together with such other members of the Committee as may be attending the Congress.

1.4 Election of officers for forthcoming period of activities (Agenda Item 1.4)

The Chairman announced that he did not wish to be re-nominated for office on the Committee. The following were then proposed and elected by acclamation: Dr. C. Lucas (Chairman), Mr. D. McKernan (Vice-Chairman and Rapporteur) and Dr. G. Mitra (Vice-Chairman). Great appreciation was expressed by the Committee to the retiring Chairman for his able and inspiring conduct of the business of the Committee during its first years of activity. His remarks in reply are summarized in Annex 8.

2. IMPLEMENTATION OF RECOMMENDATIONS OF THE SECOND SESSION

The Secretary gave a general review of the action taken by FAO on the recommendations passed at the Second Session. He announced that many of these recommendations are dealt with under specific items of the Agenda for the present Session, and in the documents for the meeting. However, it was agreed that for the information of members, the Secretariat should prepare a short document summarizing this action.

3. GUIDE LINES FOR FUTURE PROGRAMS

In introducing this item the Director of Fisheries Division told the Committee that, because of his presence in Rome, it would be possible to have the benefit of Dr. H. Kasahara's experience as Fisheries Project Officer on the staff of the UN Special Fund. The Chairman welcomed Dr. Kasahara, whose contribution to the discussion on Item 3.1 was greatly appreciated.

3.1 The Rôle of FAO in World Fishery Development (Agenda Item 3.1)

In relation to document C 65/3 Sup. 1 of the 13th Session of the FAO Conference on "The Rôle of FAO in World Fishery Development", the Chairman referred to the Director's outline of the program by which, because of the rapidly increasing demands being made on its services, the Director-General proposed to raise the Division to the status of a Department. Note was taken of the proposed structure of the Department and the successive stages by which the budget should be increased, to provide increased staff and facilities, so as not only to permit extension of the range of activities, but also to ensure support for the present regular program of work, which the Committee regards as the essential foundation for the proposed expansion. The Committee expresses its sincere appreciation of the careful consideration given by the Director-General of the advice it had offered during the past two years. The Committee resolves to record its view that the proposed creation of a Division of Fishery Resources and Exploitation, which could bring the Division's work on fishing boats and gear into closer association with its biological work, should bring important operational advantages. The elevation to Branch status of what were previously Sections will undoubtedly strengthen the work in their fields.

The Committee was greatly interested also in the Director-General's proposals concerning the appointment of a Permanent Committee on Fisheries, composed of senior fisheries representatives of selected member countries of FAO.

Recognizing the essentially international nature of the living resources of the oceans, and of the many problems that the investigation and rational exploitation of them present, ACMRR notes this proposal and sincerely hopes that, if the proposal is adopted by the Conference, the ACMRR may, through the Director-General, be able to advise the Committee on Fisheries on matters relating to marine resources research.

3.1.1 Reaction of the FAO Fisheries Division's Regular Program on Marine Resources Research to Special Fund and EPTA Activities (Agenda Items 3.1, 3.2)

Consideration of this problem arises from the discussion by the Committee of Item 3.1 "The Rôle of FAO in World Fishery Development", and also of the "World Program of Marine Resources Research" (see Item 3.2 below).

The Committee noted the great value of UNSF and EPTA projects for the basic objectives of FAO, that is the effective use of the world's resources for the better nutrition of mankind. Not only is participation in these projects part of the proper function of the Fisheries Division of FAO, but the projects, though in themselves national or regional, can contribute much to the Division's program as a whole. To assure the effectiveness of the UNSF and EPTA projects a great and unpredictable volume of work for the Biology Branch of the Division is necessary, including, in addition to its basic scientific duties, managerial activities in which the staff now employed for these basic continuing activities are not always experienced. The UNSF and EPTA projects have therefore had a very serious impact on the Branch through a work over-load and through interference with, or even disruption of, important activities. The Committee emphasizes its view that the basic continuing activities under the Regular Program are essential not only to the more general technical support for improved use of the world's marine resources, but also to the UNSF and EPTA projects themselves. Such activities as the collection, retrieval and dissemination of scientific information, to which reference is made elsewhere in this report, must be continued and enlarged if the Branch is to maintain its competence in its field of responsibility, carry out Regular Program activities, give adequate support to UNSF and EPTA projects and, in general, play its part in the leading rôle which the Conference wishes FAO to play in world fishery development.

The Committee reaffirms its considered opinion that the resources of the Fisheries Division in this field in money and personnel are quite inadequate to the great world-wide tasks assigned to it. Some impairment of its basic activities is already noted and, in view of the growing demands both from Regular Program and from UNSF and EPTA activities, there is danger of serious disruption. The Committee stresses the urgency of meeting this danger by provision of additional resources at the earliest possible date. Noting the unpredictable and sometimes temporary nature of the work requirements for UNSF and EPTA projects, the Committee recommends that greater provision be made in these projects themselves for the additional work they involve. In the opinion of the Committee resources provided within the projects should include increased support for the basic scientific headquarters activities on which so much dependence must be placed. In this connection the Committee noted that the considered opinion of members experienced in research contracts in this field is that the overhead costs to the executing agency are 25% or more. The Committee also stresses that the participation of FAO at as early a stage as possible in the formulation of these projects would contribute to the efficient use of personnel and funds, and to the ultimate effectiveness of the projects. It believes that the additional resources referred to above should be available during the preparatory stage.

3.2 World Program of Marine Resources Research (Agenda Item 3.2)

The Committee heard the Chief of Biology Branch explain in more detail the present thinking of the Branch concerning this aspect of its work, which had been outlined in the introductory statements by the Director-General and the Director of the Division. It seemed important to establish a time schedule for this work so that by the date of the proposed world meeting in 1970/71 it would be possible to state the extent of present knowledge about the resources, their distribution and potential yield; to put this statement alongside an inventory of the relevant research programs in progress and from this to prepare suggested guidelines for the magnitude and direction of the necessary continuing research effort to appraise the resources and provide the scientific basis for their rational exploitation and improvement. Preparations for this work would obviously need to be made as far as possible with the assistance, or through the activities, of those regional and specialized fisheries bodies which are concerned with marine investigations, and of the other UN Specialized Agencies.

Members of the Committee contributed their views; among these were that in order to avoid misunderstanding reference should perhaps be made to an "appraisal" rather than to a "program"; that the appraisal should be of the results of research; and that due account should be taken of research activities under field programs. The Committee then proceeded to discuss, in this context, the requirements for scientific planning in field programs, especially in pre-investment projects of the UN Special Fund. After some general discussion concerning the possibility of setting out generalized requirements with respect, for example, to pelagic surveys, the Committee referred these and other questions to a Working Party consisting of G.L. Kesteven (Convener), D.H. Cushing, G. Mitra, J. Adjetey and W.M. Chapman. The Working Party met twice during the Session, and consulted on those occasions the Rapporteur, M. Girard, S.J. Holt and J-O. Traung. Pertinent extracts of the report of this Working Party are appended to this Report (see Annex 7).

3.3 FAO Regional Fisheries Councils and Commissions (Agenda Item 3.3 - ACMRR/3/Rec.1)

The Secretary informed the Committee that FAO had not yet implemented the recommendation of the Second Session (ACMRR/2/Rec.14) to establish a Working Party to propose ways in which the work of the FAO Regional Fisheries Councils and Commissions in relation to marine resources research might be be made more effective. The Committee agreed that the importance of the Working Party's task had not diminished since the Second Session, and it recommends that the proposed Working Party be established and start its work as soon as possible. Its terms of reference should be as originally laid down in referring particularly to the needs of the Indo-Pacific region, but in order to increase the scope of the advice to FAO, additional members should be added to the Working Party from the Mediterranean and North Pacific regions respectively. For this purpose the Committee recommends the appointment of Dr. J. Furnestin and Dr. P.A. Larkin, respectively.

3.4 Fisheries Aspects of Marine Pollution (Agenda Item 3.4 - ACMRR/3/Rec.2)

It is generally known that pollution may lead to deterioration of environmental conditions and, in extreme cases, to complete destruction of a natural fishery resource. The popular idea that rivers are to be used as natural sewers is dying slowly, but it is still commonly accepted that the sea is an ideal place to deposit any unwanted by-products of civilization and industrialization. The Committee stresses, however, that great care must be exercised in the disposal of waste material if damage is not to be caused.

The Committee was informed that certain Member Governments had recently drawn the attention of FAO to the fact that marine pollution is, in certain areas, becoming a serious problem and one of increasing concern with regard to its effects on fisheries resources. Knowledge of these effects is inadequate, although it is believed that they are becoming of such magnitude that new measures of international control of marine pollution are needed. Further evidence of concern in countries is provided by the Resolution 910 (XXXIV) of ECOSOC, relating to environmental pollution generally.

The Committee discussed this matter at some length, several members giving examples from experience in their own areas of the serious and growing concern about the effects of a wide variety of pollutants. It was agreed that initiation of an active program by FAO in this field was indeed timely, if not overdue, and that in such a program consideration should be given to the known and possible effects of the accidental or deliberate introduction into the sea of significant quantities of foreign materials of all kinds. The FAO program should thus relate not only to discharges from ships, from drilling the seabed and from the land, of oily substances, and contamination by radioactive materials - many aspects of which are already the concern of IMCO and the IAEA respectively - but also to noxious chemicals including pesticides, sewage, persistent solid rubbish (plastic material, metal containers, unexploded ammunition, vehicle bodies, were mentioned) and other urban, industrial and agricultural wastes.

The harmful effect of domestic sewage in freshwaters has long been recognized and in some countries where the problem had become serious, vigorous action is being taken to ameliorate it. Harmful quantities of sewage still reach the sea, however, by way of rivers and directly from coastal towns.

The threat of contamination by radioactive substances is a relatively new one, of the last decade or so. Its characteristics are such that there is much public awareness of it, especially in relation to human health. Likewise, pollution by discharge of oil from ships has, in recent years, been initially through the UN and latterly through IMCO, the subject of intergovernmental discussion and conventions, and there seem good prospects of its being kept within bounds and eventually virtually eliminated.

The Committee noted that staff of the Biology Branch had participated in the work of the new IMCO Sub-Committee on Oil Pollution and agreed that it was desirable for such cooperation to continue. While oil and tar may contaminate boats and fishing gears, and make fish catches, through acquired bad flavour, lose their market value, the essence of governmental replies to the 1963 IMCO questionnaire was that their effects on the productivity of the resources were not very great. The same might have been said of oil from ship-wrecks, underwater drilling and seepages. There is no international machinery for control of submarine pollution by oil or by gas. The latter may not have significant deleterious effects on the fishery resources when the gas is not rich in hydrocarbons. When the proportion of hydrocarbons is rather high, however, their presence can lead to high concentrations of bacteria which are metabolising them and in doing so creating a local oxygen deficit which can affect the rate and pattern of biological productivity.

With respect to industrial wastes, there has been a development of national laws controlling or completely prohibiting their disposal on land or into freshwaters, and in some cases into estuaries and territorial waters. This, unfortunately, is contributing to a trend towards the uncontrolled dumping of of such wastes on the high seas. The tendency is, for convenience, to dump these materials as near to the point of origin as existing limited legislation permits. Especially important among industrial wastes are those having organic components, including, in addition to pesticides of all kinds, chlorinated hydro-carbons, cyanides and solutions in which the solvent is chloroform.

Even when domestic and industrial wastes are treated by modern plants and organic matter removed before discharge into inland waters, the clear effluent can still affect the resources. This is because of their high content of nutrients and trace elements which in certain circumstances may cause excessive primary production. Although in this way the waters are made "richer" it does not mean that the resources are "improved" in all instances.

The Committee considered that while it is concerned primarily with research, its duty is to point out that some degree of control is justified even before research fully elucidates the effects of pollution. At the very least there is need for maintaining detailed records of deliberate discharges of pollutants at sea (as provided for in the case of oil by the IMCO Convention and its Amendments); for reporting as far as possible cases of accidental pollution and the observed effects of pollution; and eventually for a global monitoring in areas liable to pollution.

In many cases it is technically possible to avoid pollution at a cost which may be less than the value of damage or permanent loss caused to the resources, provided that the appropriate facilities, which might sometimes need to be international ones, are provided. Thus, organic wastes can be incinerated or otherwise transformed, leaving residues that may be considered not to be pollutants and disposed of at sea or elsewhere.

It is desirable that such pollutants as might continue deliberately to be introduced under control, should be disposed of in such a way that their effects on the fisheries resources are minimized, either through being introduced in zones where there is little or no water movement - if such zones exist - or, conversely, in areas where water movement will ensure wide dispersion and dilution of pollutants, or convey them to other areas where the harm they might do is minimized or localized.

The scope of the Fisheries Division program must necessarily cover pollution in both marine and inland waters. With respect to marine waters the importance of the rivers in carrying the pollutants into estuaries, and eventually into the open sea, is recognized. Inland pollution is also related to marine resources through the effects of river and estuarine pollution on the spawning areas of anadromous species, and on the flavour of seaward migrating survivors. Further, much experience of research on freshwater pollution is highly relevant to the marine problems. It is essential to study in the sea, as in rivers and lakes, not just the direct lethal effects of pollutants on fish (this term is here used to include shellfish and other useful organisms), but also the sub-lethal biological effects which may lead eventually to adverse changes in stocks, either directly or indirectly, through effects on the food web. Such indirect effects on growth, mortality and reproduction and on the quality of the fish (adverse effect on flavour and hence reduction of the economic value of the catch, and thus of the resource), and even perhaps of movement of stocks, may be difficult to detect or predict and may involve a time lag, but nevertheless be of great consequence in the long-run. It is for this reason that ecological research being carried out in certain institutes, relating for example to the overall effects of radioactive contamination, is to be commended. Even non-lethal effects, such as individual deformities, can sometimes provide indicators of the existence of pollution.

The Committee considered that the specific actions to be taken by FAO this year and suggested by the Director-General for future biennia, namely:

(a) to take the initiative through the ACC Sub-Committee on Oceanography to obtain from governments information and their views about marine pollution, its effects and trends, relevant research conducted or planned, and possible needs for control, with a view to developing

concerted action by the UN and its specialized agencies concerned, and

(b) to prepare for, and convene in the 1968/69 biennium, a world scientific and technical meeting on marine pollution and its effects on fisheries resources,

are justified and opportune.

With respect to (a) the Committee recommends that the proposed questionnaire to be drawn up by the ACC Sub-Committee on Oceanography should cover pollution in the broad sense defined above, and should be transmitted to all departments in member governments which may be concerned with its effects and its control, as well as with scientific research relating to it.

With respect to (b) the Committee recommends that the proposed meeting also should be concerned with pollution in the broad sense and with all aspects of its effects on living marine resources. While the meeting should be directed primarily to investigations of marine pollution (including estuarine environments) and of contamination other than by radioactive materials, it is important that the experience of research on freshwaters and on radioactive contamination be brought to bear on the discussion by submission of review papers and participation in the meeting by leading scientists from that field and in other ways. The Committee considered that this meeting could constitute a contribution by FAO to the objectives of the International Biological Program, and therefore suggested that preparations for it might be made in consultation with the PM (Productivity of Marine Communities) Sectional Committee of the SCIBP, which will be concerned, within the IBP, especially with the study of those parts of the marine environment readily accessible to man and therefore likely to be affected by pollution.

With respect to the dispersion of pollutants in the sea, the Committee recommends that the attention of the ACC Sub-Committee on Oceanography and of the IOC be drawn to inadequacies in knowledge of the relevant oceanographic features, and to the scope and need for application of oceanography in the design of protective measures.

Lastly, the Committee recommends that the above information and views be transmitted to the ACC Sub-Committee on Oceanography, the IMCO Sub-Committee on Oil Pollution and other international bodies concerned.

3.5 Tuna Investigations and Conservation (Agenda Item 3.5)

The Committee was informed by the Secretariat of the work done by the FAO Expert Panel for the Facilitation of Tuna Research during and since its first session in June 1964, leading to the setting up of Working Parties on tuna ecology, tuna length measurement and tabulation, multi-disciplinary approach to selected tuna taxonomic problems and tuna taxonomy. The second session of the Panel will be held immediately before the 11th Pacific Science Congress, to take place in Tokyo. Negotiations are being carried out with the Japanese Government on this matter.

The Committee was also informed that the second session of the FAO Working Party for Rational Utilization of Tuna Resources in the Atlantic Ocean would probably take place from 6-13 July 1965. It is expected that during that session the Working Party will draft an instrument which would subsequently be considered by interested nations and used as a basic document for a Conference of Plenipotentiaries, in drafting a convention establishing an Atlantic Tuna Commission. The Conference of Plenipotentiaries, if approved by the 13th Session of the FAO Conference, should take place early in 1966.

There was considerable discussion of the problems of establishing such a Commission. Concern was expressed that while the lengthy national and international procedures were being followed, tuna fishing in the Atlantic continues to develop rapidly, in the absence of any adequate international effort to organize the collection of biological statistics and undertake the urgently needed studies of the biology and state of the tuna stocks in the area. The Committee noted with approval FAO's activities to promote tuna research in general and the action taken towards the establishment of an appropriate inter-governmental body for the Atlantic Ocean.

4. FISHERIES DIVISION PROGRAM OF WORK FOR 1966/67 AND FOLLOWING BIENNIA IN THE FIELD OF MARINE RESOURCES RESEARCH AND MANAGEMENT

4.1 Intelligence on Current Activities

4.1.1 "Current Bibliography for Aquatic Sciences and Fisheries" and Related Activities (Agenda Item 4.1 - ACMRR/3/Rec.3)

The Secretariat briefly summarized the bibliographic basis to the intelligence service developed by the Biology Branch and explained, with the help of flow diagrams, the complicated nature of the fully mechanized computer retrieval system which is at present being developed with the collaboration of the Aquatic Sciences Information Retrieval Center of the University of Rhode Island. The problems encountered in developing such a system were reviewed, and it was stated that, since one of the constitutional requirements of FAO is to disseminate information to scientists working in the field in which FAO itself is actively engaged, a mechanized system such as the one developed by the Biology Branch could meet such requirements in the field of aquatic sciences and fisheries. With growing field programs there is a great need for efficient and swift compilation and evaluation of existing scientific information for their better formulation and execution.

Subsequently, a guided tour was conducted in the premises of the Biology Branch, during which the details of the intelligence system were demonstrated to the members of the Committee and their questions were answered.

Bibliographic work and related activities of the Biology Branch are a basic and indispensible element of its program, essential in their own right to world fisheries science and absolutely necessary for the planning and conduct of the field program. However, this work has suffered seriously from the impact of the field programs and at the time of the meeting the Branch was gravely concerned about a massive backlog and a need for drastic revision of its work plan. This is particularly serious in view of what is said under that item about the need to make use of all available data in the planning and conduct of field projects. The machinery created by the Branch for this bibliographic and information service could provide much of what is needed for the field projects, but to do so will involve an expansion of Branch resources over and above what is required to ensure effective maintenance of the Branch's present program.

Considering the vital importance of this service to field projects alone, the Committee recommends that means urgently be explored to draw financial support to the service from the field programs. An emergency situation exists at present; the Branch needs special immediate help, perhaps directly from other sources, to enable it to resume the level of work it had achieved by the end of 1963. But

beyond this it is in need of additional continuing resources to enable it to realize the full potentialities of the system it has created.

4.1.2 "International Marine Science" (Agenda Item 4.2)

The representative of UNESCO informed the Committee of the present state of publication and distribution of "International Marine Science" (IMS). He pointed to the considerable work load this involves for his Organization.

The Committee considered in some detail the aims of the IMS. Originally, these were to provide information about forth-coming activities in marine science, and to give reference to important news on national and international research institutions and their publications; more recently, information has also been given on oceanographic equipment.

It was agreed that this publication has been of value, especially to scientists in the developing countries and those working away from the main centers of marine research. However, the Committee felt that the first of these aims is not adequately met by the present relatively slow publication and circulation system. The Committee considers that the next step towards improving the content and circulation of IMS would be for the Secretariats of UNESCO and FAO to look jointly into the possibilities of :

(i) circulating by air-letter, as advance information, to marine research institutions, lists of forth-coming meetings, cruise programs and other news items of immediate importance,

(ii) merging their distributional systems for IMS,

(iii) making further improvements in IMS as a reference publication on national and international institutions and organizations, their activities and periodicals,

(iv) producing, in addition to the lists of equipment, lists of important reference books in various fields of marine science. Such lists should assist in training schemes in various parts of the world.

4.1.3 SCOR Working Group on Marine Science Abstracts and Bibliographies (Agenda Item 4.1)

The Secretariat reported on its participation in the first meeting of this Working Group, the Convener of which, Dr. S. Saila, is in charge of the Aquatic Sciences Information Retrieval Center (University of Rhode Island), which collaborates very closely with FAO in this field. The discussions in this Working Group are directly pertinent to the Biology Branch work on intelligence and documentation, and indeed the Group had agreed that its proposals should essentially be directed towards the improvement of the "Current Bibliography for Aquatic Sciences and Fisheries" as a reference tool for marine scientists, and to ways of supplementing it by other services. In this latter connection emphasis had been given to a current awareness service on the lines of the periodical "Current Contents". By this periodical are reproduced and distributed rapidly copies of the contents pages of selected scientific journals and reviews, and lists of papers contributed to relevant meetings and symposia; ancillary

services are provided, including provision of copies of listed articles and indexes of authors and their addresses. The Director of the Institute for Scientific Information, which prepares and publishes "Current Contents", had kindly made available to the Committee descriptive material concerning this and other services his Institute provides.

The Committee emphasized that FAO should take all possible action to implement or support the recommendations of the SCOR Working Group, but noted that its ability to do this depends on success in maintaining and developing the bibliographic work of the Biology Branch. The Working Group would be meeting again in the near future, and the Committee requested the Secretariat to report again on this matter to its Fourth Session.

4.2 Organization of Research, Education and Training

4.2.1 Manuals and Study Tours (Agenda Item 4.2 - ACMRR/3/Rec.4)

After giving an account of the history and present development of the proposed series of training manuals, the Secretariat referred to the recent arrangements made with ICES for the joint production and publication of a series of statistical chapters in FAO's Manual of Sampling and Statistical Methods for Fisheries Science; two are nearly ready for the first stage of production, when they can suitably be assessed by a wider range of experts and prospective users. While certain problems were evident in the production of these and other training materials, the Committee notes the progress made in the face of difficulties. It also commends the steps being taken in co-operation with ICES and ICNAF for the experimental compilation of a bibliography of the principal fisheries and marine research literature published by these organizations.

In answer to questions concerning the value of study tours as a contribution to training needs, several tributes were paid to the value of the recent Study Tour on Fisheries Biology and Oceanography in the USSR, especially for the more experienced scientists, and several members considered that greater use might be made of such tours. Special praise was given to the series of lectures provided in English, French and Spanish on that occasion both by members of the Committee who had participated in the tour and those who had examined the manuscripts of those lectures made available to them by the Secretariat. The Committee recommends that every effort be made to find means to edit and publish these and that provision be made for publication of similar series of lectures from future study tours, so that they may be made available for use by a much wider audience than the few participating in the tour in question. In particular it recommends that arrangements be made in the future to include in the EPTA budget for study tours an item for the publication of such lectures before the end of the biennium or, where the late dating of the tour is likely to make this impossible, to provide for such publication in the subsequent biennium. The Committee further recommends that the possibility be explored of the valuable series of lectures given during the USSR tour, being published by the USSR itself, in one or more of the official FAO languages for a wider circulation.

Lastly, following further discussion of the means whereby facilities for study tours might be made available more widely, the Committee recommends examination of every means of taking advantage of the experience and facilities available in countries with more developed fisheries, and conducting advanced research, so that they can be studied more widely, considering especially any means whereby study

tours might in the future be arranged in countries irrespective of the convertibility of their currency.

4.2.2 International Conference on Fisheries Administration (Agenda Item 4.2)

The Committee received a progress report on the action taken on ACMRR/2/Rec.7. "Country papers", on the organization and administration of fisheries research, from some of the countries listed in that Recommendation (Canada, France, India, Japan, Norway, Peru, United Kingdom) have been forwarded to Dr. Kesteven, as material for the general paper he had been asked by FAO to prepare. Such papers have not yet been received from the other countries listed. Dr. W. Cieglewicz announced that the paper from Poland would be submitted very soon. The Conference has for budgetary reasons been postponed.

The Committee notes the action taken by the Secretariat on this subject and expresses the hope that the remaining country papers will be sent to FAO in the near future, so that sufficient time will be available for Dr. Kesteven to finalize the general paper and for FAO to translate it in time for the Conference.

4.2.3 Symposium on Fisheries Education at IPFC 12th Session (Agenda Item 4.2 - ACMRR/3/Rec.5)

The Secretariat called the attention of the Committee to the plans of the IPFC to hold a Symposium on Fisheries Education, in conjunction with its 12th Session. The subject is considered to be of such broad interest that Fisheries Division wished to have the advice of the Committee on the best way of assisting in the organization of the Symposium, and on the desirability of similar activities in other areas.

The Convener of the Symposium outlined its aims and pointed out that its subject is not the whole field of fisheries science, but the needs for and techniques of education in this specialized field. He summarized the main items in the prospectus for the Symposium and pointed out that the support of UNESCO and FAO would be needed to ensure the proper treatment of some items.

A lengthy discussion took place in which some members explained the current trends in education in fisheries in their countries. The consensus of opinion was that in many areas lack of qualified personnel was hampering fisheries development, and that more attention should be devoted by international organizations to the study of this problem.

The Committee recommends that the IPFC Symposium should receive all possible assistance from FAO, either directly or by the use of consultants. It further recommends that Fisheries Division consider the advisability of stimulating other regional symposia of this sort, with the eventual objective of a world-wide consideration of training problems. The Committee recommends that the assistance of UNESCO in this project be sought.

4.2.4 Training Centre on Marine Resource Assessment in Latin America (Agenda Item 4.2)

The Secretariat informed the Committee that, following the successful conduct by the Branch during the 1963/64 EPTA biennium of Training

Centers on aspects of stock assessment in the Indo-Pacific and Mediterranean regions, a proposal for such a centre in Latin America during 1966 has been included in the EPTA Regional Program for 1965/66. It was hoped to conduct this Training Centre in Chile. An interesting aspect of this was that it would be the first time such a centre had been conducted at an institute supported by the UN Special Fund, and it was expected that the staff of the Institute would participate actively in it. The Committee agrees that this Training Centre was particularly timely in view of the interest shown in this problem in recent years by ECLA and the fact that the forthcoming FAO Regional Conference for Latin America had the problem of marine resource surveys as an important item on its agenda.

4.3 FAO Meetings

4.3.1 World Scientific Meetings on the Biology of Species of Commercial Importance (Agenda Item 4.3)

The Secretariat outlined the preparations now being made for a World Meeting on the Biology and Culture of Shrimps and Prawns in 1967, which was approved in principle by the 12th Session of the FAO Conference and is now included in the Director-General's proposed Program of Work and Budget for 1966/67. The Committee reaffirms the importance of such meetings and attention was drawn to the ways in which they contribute to other projects in the Biology Branch Program, such as the preparation of synopses on the biology of species and stocks. The Committee notes the proposals to hold one such meeting on a marine species group in each of the two following biennia and requests the Secretariat to provide an analysis relating to the priorities to be given to particular groups and the timeliness of world meetings concerning them. Meetings on anchovies and on hakes had been under consideration, and the Secretariat undertook to circulate to members of the Committee a relevant review. The Committee agrees to consider this matter at its Fourth Session, on the basis of that review.

4.3.2 Symposium on Tropho-dynamics of Marine Communities (Agenda Item 4.3 - ACMRR/3/Rec.6)

The interim report of the Working Party set up at the Second Session (ACMRR/2/Rec.11) was received and it was noted that so far the proceedings had been conducted by correspondence. The Secretariat reported that approval had now been obtained for the membership of Dr. M.E. Vinogradov in the Working Party.

The view of the Working Party that it would be timely to hold such a symposium in the near future was discussed at length, and the Committee agrees that it would be of interest and real value to marine workers in this field for such a symposium to be held. It was also noted that its objectives would be very relevant to the work of the Marine Communities Sectional Committee of the International Biological Programme. The suggestion that the Symposium should be held in 1967 had to be considered in relation to other commitments, both on the part of FAO and of some regional organizations, and the information received concerning the possibility that a symposium on a closely related subject might be part of Japanese plans for the Pacific Science Congress in 1966.

The Committee recommends that a symposium, under a modified title such as "Food Chains in the Sea", should be held in the Autumn of 1968, preferably under the joint sponsorship of FAO, ICNAF, ICES and IOC. It further recommends that ICES should be requested to provide for such a symposium to be held during the course of its annual meeting in 1968 (expected to be in Copenhagen), along the lines of the more detailed program recommendations to be made by the ACMRR Working Party.

Accordingly, ICNAF, IOC and ICES should each be requested to co-sponsor the symposium, the invitations being sent in time for them to be considered conveniently at their forthcoming Commission, Bureau and Council meetings, respectively, and the answers conveyed to each body.

Consideration was also given to ways of sharing in the preparation for, and proceedings subsequent to, the symposium, should the invitation be acceptable, and it was decided to suggest to each body that :

(i) FAO might pay any necessary expenses of the Working Group if it needs to meet, as well as providing trilingual interpretation at the symposium;

(ii) ICES might be responsible for providing accomodation and normal facilities for the meeting, with a part share in the costs of subsequent publication;

(iii) ICNAF might take a fuller share in the costs of publication;

(iv) IOC (through UNESCO) might help greatly by covering costs of attendance for a number of scientists whose contributions would urgently be needed, but who are not normally able to attend ICES meetings.

Meanwhile, in the hope of these proposals proving acceptable, the Working Party should continue its planning, along the lines indicated, so that a more detailed program shall be available as soon as possible, and certainly before the fourth session of ACMRR. If necessary, the Working Party might meet, subject to consultation with the Secretary of the ACMRR.

4.3.3 FAO Symposium on Fish Behaviour and Gear Research (Agenda Item 4.3 - ACMRR/3/Rec.7)

The Secretariat announced that it was proposed to hold an expert meeting on fish behaviour and gear research in 1966/67, the preparation for and conduct of which would be the joint responsibility of proposed Marine Biology and Environment and Fishing Operations Branches. This would be a new type of meeting for FAO, which would bring together gear technologists and fish behaviourists in discussions of the interplay of engineering and biological factors governing capture by fishing gears.

While general support for the proposal to hold such a meeting was expressed, views differed as to an appropriate time to hold it. One view was that it should be held, as proposed by the Secretariat in 1966/67, because of the urgent need to appraise the present state of knowledge on this subject, to discuss methods of investigation and to formulate plans for further work. Another view was that it should

be delayed in order that results could be reported to it of investigations with methods now coming into use. The Committee therefore agrees that such an expert meeting should be held and recommends that FAO should seek the views of prospective contributors before deciding on its timing.

4.4 Development and Assistance in Stock Assessment

4.4.1 FAO Fisheries Data Centre (Agenda Item 4.4)

The Committee was informed that FAO had acceded to the request of the IOC that it should provide a clearing house for fisheries data coming from the International Indian Ocean Expedition (IIOE). The Secretariat explained that its concept of this responsibility, which might be extended to cover data from certain other international projects, especially from those sponsored by the IOC, was to provide essentially a data registry, maintaining an inventory of existing data and relevant publications, and assisting exchange in various ways. Development and maintenance of the Fisheries Data Centre would, within the proposed Fisheries Resources and Exploitation Division, be a responsibility of the Fish Stock Evaluation Branch, and this work would therefore be closely associated with the bibliographic and documentation activities on the one hand and the stock assessment activities on the other. In this connection the Branch would also maintain, as a part of the development of the World Program of Marine Resources Research, an inventory of the biological statistics on exploited stocks being collected and compiled by national research agencies and by regional fisheries bodies.

4.4.2 Statistics for Research Purposes (Agenda Item 4.4 - ACMRR/3/Rec.8)

The relevant parts of the program and activities of the FAO Fisheries Statistics Section were outlined by the Secretariat. The Committee's attention was drawn to the close collaboration which has been maintained by that Section with ICES and ICNAF in improving and standardizing the collection and publication of fishery statistics for the North Atlantic; in this connection the useful work done by FAO, ICES and ICNAF, through the Continuing Working Party on Fishery Statistics in the North Atlantic area was noted. The Fisheries Statistics Section is also assisting the Working Party on the Rational Utilization of Tuna Resources in the Atlantic Ocean, and other regional bodies, particularly CARPAS.

It was explained that the "Yearbook of Fishery Statistics" is now being published in two volumes, one dealing with catch and landings statistics and the other with fishery commodities statistics; in addition, a series of fisheries bulletins is now being produced by FAO, one of those gives the 1963 catch statistics by species and countries in the North Atlantic, according to groups of ICES and ICNAF fishing areas.

It was announced that these commitments had taken up a large part of the Section's time in recent years, but now that a great deal of standardization has been achieved for the North Atlantic, this workload should diminish, thereby allowing more time to be devoted to statistical problems in other areas. As part of this wider program, a start has been made in producing a breakdown of the world oceans into statistical regions. A trial scheme has been drawn up and widely circulated for comments throughout the world.

The Committee notes that, notwithstanding the excellent work done by the Statistics Section, there are still many regions of rapid fishing development, e.g. off West African, for which there are completely inadequate statistics of catch by species, let alone the more detailed, refined statistics needed for stock assessment purposes. It re-emphasizes that statistics of total catches by species and areas, and of appropriate measures of fishing effort are a minimum requirement for rational exploitation of fishery resources, as they are essential both for the assessment of these resources, in order to plan fishery development on an economic basis, and for the recognition of the need for fishery regulation. The Committee therefore recommends that the urgent necessity of providing such minimum statistics be brought strongly to the attention of those governments not already doing so for all fisheries in which their nationals engage.

The Committee considers that regional bodies, in collaboration with FAO should play a major part in formulating the requirements for, and organizing the collection of, these statistics, and for the more detailed statistics for purposes of advanced studies, on which to base more accurate assessments and the design of regulations. In this regard the Committee also notes with approval the recent appointment of a Regional Fisheries Statistician for the Indo-Pacific region and hopes that his activities will promote the prompt and adequate flow of fisheries statistics data available in that region. The Committee hopes that similar appointments would, in the near future, follow in other regions.

4.4.3 Direct and Speedier Estimation of Fish Abundance (Agenda Item 4.4 - ACMRR/3/Rec.9)

The Working Party, established on the recommendation of the second session (ACMRR/2/Rec.12), to review recent work in the rapidly developing field of direct and speedier estimation of fish abundance presented a detailed report to the Committee. This report had been prepared at a meeting of the Working Party preceding the 3rd ACMRR Session, at which were present: B.B. Parrish (Convener); D.H. Cushing, L.S.Midttun (Members of the Working Party); V. Valdez (FAO Consultant); F. Gneri, G.L. Kesteven (Members of ACMRR); M. Ruivo (Secretary of ACMRR); S.J. Holt, E.F. Akyüz, L.K. Boerema (Staff Members of FAO Fisheries Biology Branch). The report reviewed the present state of development and application of some direct and indirect methods for estimating relative and absolute fish abundance, which might be used instead of, or in addition to, the traditional ones, both in exploratory resource appraisal investigations and in detailed population studies of exploited stocks. The direct methods examined were the use of acoustic and optical fish detection techniques, and the indirect ones the use of egg and larval abundance surveys.

The Committee commends the work done by the Working Party, and notes its special relevance in the light of the recent choice which it keenly appreciates, of this subject, by the UN Advisory Committee on the Application of Science and Technology to Development as one of high priority. The Committee approves the Conclusions and Recommendations of the Working Party, set out below, and recommends that the Director-General gives effect to them as appropriate, including bringing them to the attention of member governments, regional fisheries bodies, and research institutions and scientists concerned.

Conclusions and Recommendations of Working Party on the Direct and Speedier Estimation of Fish Abundance

"Of the direct and indirect methods of estimating relative or absolute abundance of fish, considered by the Working Party, acoustic fish detection techniques have the greatest potentialities and widest application both in exploratory, resource measurement investigations, and in detailed population studies of exploited stocks.

"Existing commercial acoustic detection equipment, when calibrated, can be used to give estimates of relative abundance and, when combined with other methods of measuring fish density (e.g. photography), also rough estimates of absolute abundance. Such methods can be applied equally in exploratory surveys in unexplored areas and in fleet or research vessel sampling of exploited stocks.

"However, for estimating absolute abundance directly, more specialized high resolution equipment, in conjunction with counting systems is needed. Such equipment, including high frequency, narrow beam echo-sounders, sector scanners and FM scanners, is under development and coming into use in some countries. Because of the great potentialities of such instruments for abundance estimation, the Working Party recommends that their development and subsequent operational trial in such work, in as wide a range of situations as possible, be encouraged. As far as possible, opportunities that might be offered for this purpose by FAO's field programmes should be followed up.

"In association with the use of such equipment for abundance estimation, further research is needed, especially on:

(a) the target strengths of individuals and shoals of fish (in all directional aspects) of different sizes and species;

(b) acoustic methods of determining the size of fish, using target strengths, frequency ratios and methods based on air bladder resonance;

(c) the discrimination of fish targets from bottom reverberation;

(d) the identification by photographic methods of fish detected by the acoustic equipment.

"With the rapid growth in the use of acoustic fish detection equipment in fisheries research, the need arises for fishery scientists concerned with fish stock evaluation problems, to be better informed of their principles, characteristics and use. The Working Party therefore recommends that FAO takes steps to promote a better understanding of these techniques and their application, by convening a symposium and arranging seminars on the direct estimation of abundance of fish by acoustic methods, by engaging consultants to prepare, and subsequently to publish a training manual on the physical principles of acoustic equipment and its application in fisheries work, and by holding training courses for fishery scientists, analogous to the ICES and FAO courses on population analysis.

"In the application of the echo-survey method, as with all sampling methods, problems arise concerning the design of the survey, the extent, intensity and efficiency of which govern its cost and the accuracy of abundance estimates derived from it. No theoretical, statistical treatment of the design of such surveys is currently available and the Working Party therefore further recommends that a study be made of their statistical basis, with special reference to design factors and the estimation of the variance of estimates.

"Acoustic detection methods are not applicable for accurate abundance estimation in all situations. Particular situations, where they do not apply, are of pelagic fish living in the surface water layers and of benthic organisms (e.g. some shellfish species) living on the sea-bed. In the first case aerial surveys can sometimes provide accurate estimates of relative and absolute abundance (in association with surface craft sampling), and in the second, photographic and/or direct visual observation may be used.

"Egg and larval surveys are of value in exploratory work, in support of echo-surveys, to chart the centres of density of spawning fish. If good estimates of fecundity and sex ratio are available from catch sampling, estimates of absolute abundance of spawning fish can be obtained, especially from well planned egg surveys."

The Committee further recommends that the Working Party be requested to:

(i) continue its appraisal of these methods on a broader area basis,

(ii) commence the preparation of a training manual on the physical principles of acoustic fish detection equipment and their application in fisheries work, and

(iii) assist the FAO Secretariat in following up its recommendation concerning the holding of training courses for fishery biologists in acoustic fish detection methods.

It accordingly recommends that the membership of the Working Party be increased to include the following experts: Dr. R. Whitney, (USA), Dr. M.D. Truskanov (USSR), Prof. Y. Hiyama (Japan) and Dr. G.L. Kesteven (Australia).

4.5 Environmental Studies

4.5.1 Fisheries Oceanographic Synopses (Agenda Item 4.5 - ACMRR/3/Rec.10)

The Secretariat reported on the activities of the Joint GFCM/CIESMM Working Party, established in 1964 in accordance with the suggestion of ACMRR that a synopsis be prepared on oceanography of the Mediterranean in its fisheries aspects, following the pattern adopted for the North Sea synopsis. The Joint Working Party met in Monaco in October 1964 (at the time of the CIESMM Session). It was attended by the members nominated by GFCM and CIESMM, together with the representatives of other interested international organizations and a number of other interested scientists.

The Joint Working Party discussed the outline and preparation of the synopsis, the possible forms of co-operation with the American Geographical Society for possible publication of the synopsis in the "Serial Atlas of the Marine Environment", and with NODC for data compilation. A detailed plan for the allocation of

the synopsis subjects amongst Mediterranean scientists was approved.

A second session of the Working Party is scheduled to take place in Rome in May 1965, in conjunction with the session of the GFCM.

The Committee welcomes the positive co-operation established between GFCM and CIESMM for the implementation of this project, and notes with satisfaction the progress achieved in developing the project, which is considered of great value for fisheries research in the Mediterranean. It recommends that FAO continues to give all possible assistance in this project.

4.5.2 Fishermen's Charts and Utilization of Synoptic Data (Agenda Item 4.5 - ACMRR/3/Rec.11)

The Secretariat presented to the Committee a progress report on action taken on ACMRR/2/Rec.6. Dr. O. Sette and Mr. A. Lee had been unable to accept the invitation to serve on this ACMRR Working Party. After consultation with the Chairman and Vice-Chairmen of the Committee, invitations were addressed to Mr. G.V. Howard (Tuna Research Laboratory, La Jolla, California, USA) and to Mr. J. Ramster (Fisheries Laboratory, Lowestoft, England) both of whom subsequently accepted nomination. Mr. Howard had agreed to act as Convener of the Working Party; UNESCO and WMO had nominated Dr. G. Hempel and Mr. M. Bradbury respectively. The Working Party therefore was now composed of: Mr. G.V. Howard (Convener), Mr. M. Bradbury (WMO), Dr. G. Hempel, (UNESCO), Mr. G. Ramster, Professor M. Uda. A letter was recently circulated by the Convener to members of the Working Party with a plan of activities and of steps to be followed. The first steps will be the preparation of an inventory of existing synoptic oceanographic and meteorologic charts which are available for fisheries research and fishing operations. Various tasks have been allocated among the members of the Working Party.

The Committee endorses the plans proposed by the Convener and emphasizes the increasing importance of the subject under consideration by the Working Party. In view of the information received that an active project had been undertaken in similar matters by ICES, the Committee recommends the appointment to the Working Party of Dr. J. Eggvin (Fisheries Research Institute, Bergen, Norway).

4.5.3 Booklets on Oceanography and Meteorology for Fishermen (Agenda Item 4.5)

The Committee was informed by the Secretariat that, in accordance with ACMRR/2/Rec.15, the Fisheries Oceanographer of FAO Fisheries Biology Branch had drafted a model booklet on "Fishermen and the Weather", which was circulated for comment by ACMRR members and other scientists. A revised draft has been prepared on the basis of the comments received and this was now available. The Committee was also informed that at the 4th Session of the Commission for Maritime Meteorology (CMM) of WMO, this project had been discussed at length. The Commission adopted various recommendations covering subjects of common interest to WMO and FAO, and the Commission's Recommendation 23 requested WMO to accept in principle participation in a joint Working Party with FAO for the preparation of the booklet.

The Committee notes this recommendation with pleasure and considers that co-operation between WMO and FAO would be of great value in the development of this project.

The Committee also notes that another booklet "Oceanography for Fishermen" is being prepared by FAO Fisheries Biology Branch, and the Committee welcomes continued co-operation with UNESCO in this project.

4.6 Special Fisheries Chapter of SOFA (Agenda Item 4.6)

The Secretariat explained to the Committee that the "State of Food and Agriculture" (SOFA) is a basic document of the FAO Conference, published annually in the three official languages of the Organization and internationally used as a source of reference on developments in agriculture, forestry, nutrition, and fisheries. Normally the fisheries contribution is a short section of the general review and deals primarily with production trends and trade. In recent years SOFA has included special chapters focused on major problems in selected fields. The Director-General has approved the inclusion in 1967 of a special chapter on the Management of Marine Fisheries Resources. This will provide an appropriate opportunity to review the major problems because it will coincide with the end of the first biennium of work by the proposed FAO Fisheries Department. The task of preparing this special chapter falls on the staff concerned with Marine Biology, and with Economics and the Division may also seek the assistance of consultants for this work.

The attention of the Committee was called to the tentative outline for the special fisheries chapter, which had been prepared by the Fisheries Division and circulated as a Working Paper for the Session. The Secretariat invited the Committee to make suggestions on the proposed outline and to advise on the best way of preparing the chapter. The Committee recognises the great importance of this document and expresses the opinion that a detailed, annotated outline should be circulated to members of the Committee, for individual suggestions, to permit the Division to receive comments at an early stage in the preparation of the chapter. It further suggests that it would be desirable to have a draft of the chapter presented for discussion at the fourth session of the ACMRR.

4.7 Species Synopses (Agenda Item 4.7 - ACMRR/3/Rec.12)

The Committee noted that the project to arrange for the compilation and publication of synopses of data on the biology of important species and stocks was proceeding successfully, especially through the co-operation with certain regional fisheries bodies (EIFAC, ICES, ICNAF and GFCM), the stimulus given by FAO's World Scientific Meetings on the Biology of Species of Commercial Importance and the parallel activities of certain national agencies. The interest in this project was re-affirmed by an expression of the need for synopses of certain species at the meeting of the International Co-ordinating Group for the Co-operative Study of the Kuroshio (CSK).

Consideration was given to the suggestion that some form of continuing body (an "association") be established to promote this work. The Committee considers that this suggestion is not entirely appropriate at this time; instead, it recommends that the Secretariat considers the possibility of establishing a Working Party, with representatives from co-operating institutions and organizations, which would have the function of co-ordinating efforts of this kind, working to encourage participation of other bodies and also of acting as an editorial, control

board. This Working Party should establish priorities.

5. CO-ORDINATION AND COOPERATION WITH OTHER BODIES

5.1 UN Specialized Agencies (Agenda Item 5.1)

The Committee was informed by the Secretariat that matters concerning co-ordination between FAO and other UN Agencies are being treated under other items of the Agenda, and therefore no specific matter was submitted for consideration of the Committee at this point. The Secretariat also reported that during the past year, considerable progress was achieved in developing effective concerted action with other Agencies of the UN family, particularly with UNESCO, on matters of mutual interest, and this was of great benefit to the success of many projects. The UNESCO representative also emphasized this positive trend and gave some examples, particularly of matters concerning IOC projects, and other fields of general interest to marine science and fisheries in general (e.g. on intelligence matters, especially in the preparation of IMS; training and education; promotion of research; servicing of international co-operative oceanographic investigations), which clearly show an increasing integrated action by the UNESCO Office of Oceanography and by the FAO Fisheries Biology Branch. The attention of the meeting was called to the increasing work load put upon the UNESCO Office of Oceanography, which provides the IOC Secretariat, resulting from the IOC activities, and mentioned the consideration given to this problem at the fourth session of the IOC Bureau.

A discussion followed in which some problems concerning joint activities of UNESCO and FAO were considered and some possible solutions ventilated, but the Committee felt that such an important matter would require better preparation and more time than the Committee could devote to it at the present session. The Committee notes with great satisfaction the good working relations and concerted action of UNESCO and FAO in the field of marine science and fisheries and encourages them to continue to develop this integrated action, which is considered the best way to make full use of the skills and resources of both Organizations for the benefit of their member nations and of science.

5.2 Regional Fisheries Councils and Commissions (Agenda Item 5.2)

The Secretariat informed the Committee that it hoped, within the proposed expansion of the Division's program, to extend co-operation of the kind already well established, for example, with the bodies concerned with the North Atlantic, to other non-FAO fisheries councils and commissions. Letters of agreement were being exchanged between FAO and these bodies with a view to defining more clearly their mutual interests and relationships. The Committee was also informed that FAO had entered into an agreement with the Bureau of International Whaling Statistics (which acts as the the statistical organ of the International Whaling Commission). The Bureau would provide to an FAO group of stock assessment specialists (consisting of staff members and consultants), the statistical data from the 1964/65 Antarctic pelagic whaling seasons and from future ones. That group will prepare from these data, and from such other relevant data as may be available, an assessment of the state of the Antarctic whale stocks for the information of the International Whaling Commission and of other bodies concerned.

5.3 International Biological Program (Agenda Item 5.3 - ACMRR/3/Rec.13)

The Committee heard a report on the Productivity of Marine Communities Sectional Committee of the International Biological Programme from

Mr. R.S. Glover, the Deputy Convener. It recommends that IOC and FAO continue to support this programme and that FAO, where appropriate, co-ordinate related activities in both regular and field programs, including Special Fund fishery pre-investment projects, with the IBP program.

5.4 UNESCO First Seminar on the Oceanography of the South Pacific

The UNESCO representative reported on the First Seminar on the Oceanography of the South Pacific (Lima, Peru, Nov.Dec. 1964) which was attended by a number of scientists from Latin American countries and from the U.S.A. The increase of research capacity resulting from the establishment of fisheries research centres under the UN Special Fund executed and assisted by the Fisheries Division of FAO, showed impressive results. A closer coordination of the efforts of FAO and UNESCO in Latin America, in the promotion of fisheries aspects of oceanography and marine resources research, seems advisable in the light of the recommendations of the Seminar. The attention of the Committee was drawn to Recommendation V, which asks that UNESCO organize in the 1966/67 biennium a World Symposium on Tropical Lagoons, and that this symposium be co-sponsored by IBP and FAO.

Some comments were made on the importance of tropical lagoons for fish production and on their relation to the productivity of the marine coastal zones. The Chief of Biology Branch assured the Committee that the proposal would be studied carefully, but that at present he is not in a position to take any firm commitment because this project had not been contemplated in the Program of Work and Budget for the next biennium. He thought, however, that it should at least be possible for the Fisheries Biology Branch to help in the preparation of the scientific program for the symposium.

The Committee suggests that cooperation between UNESCO and FAO for the organization of the symposium should proceed by direct consultation between the secretariats of both Organizations.

6. MATTERS ON WHICH THE INTER-GOVERNMENTAL OCEANOGRAPHIC COMMISSION HAS REQUESTED ADVICE (Agenda Item 6)

The Secretariat informed the Committee that news had been received that, because of illness, Dr. A.Alekseev would be unable to attend this Session of the Committee. In regretting his absence, the Chairman, with the full support of the members of the Committee, stressed the importance of the contribution which can be made by the members appointed by IOC and how the advice of the Committee on matters concerning the Commission would gain from their participation in ACMRR work.

6.1 General Scientific Framework for World Ocean Study (Agenda Item 6.1 - ACMRR/3 Rec.14)

A lengthy discussion took place under this item, following an account by the Secretary of IOC of the present plans for revision of the draft of the General Scientific Framework. Attention was especially directed to the way in which the present draft had been developed, as a simple combination of the contributions of SCOR and ACMRR. Whereas Part I purported to present a wide view of the range and potential of oceanographic research, in no way did Part II represent a statement on the range and objectives of fishery research. Moreover, complete sympathy was found among Committee members for the cautious views expressed by other scientists, including members of SCOR, that Part I itself should in no way be regarded, now or as amended, as a complete set of guide lines for oceanographic research. It was with such problems in mind that the Committee considered a date in May as much too early for a joint discussion with SCOR and other scientists of proposed amendments and conditions, especially as only the English and Spanish versions

had just been made available.

After further discussion the Committee recommends:

(a) that the ACMRR contribution now forming Part II of the draft GSF be withdrawn; that Dr. D.H. Cushing be requested to take account of any suggestions for modifying it and prepare a revised draft in similar form for separate publication, under a different title; that IOC be requested to accept this revised draft for publication in their "Technical Paper" series;

(b) that a Working Party comprising Dr. D.H. Cushing (Convener), Dr. W.H. Chapman and Dr. G.N. Mitra should be asked to write a fisheries section for Part I of the draft GSF in a style corresponding to the remainder of that draft, which shall give an impression of the range and interest of marine fisheries research and objectives, with discretion to discuss with the officers of IOC how this section may best be included; and

(c) that Dr. Cushing be asked to represent ACMRR at the joint meeting to be arranged by SCOR for discussion of amendments to the present draft GSF.

The Committee further recommends that the plans of Biology Branch for completing and publishing its Manual of Fisheries Science, work on which has been proceeding for some years, be commended and endorsed, and that the Branch be urged to complete it as soon as circumstances permit.

6.2 International Oceanographic Programs

6.2.1 International Indian Ocean Expedition - IIOE (Agenda Item 6.2 - ACMRR/3/Rec.15)

The Committee took note of the Recommendation concerning the IIOE by the Eleventh Session of the Indo-Pacific Fisheries Council, which reads as follows:

"The Council recognized the growing need for animal protein in the human dietary requirements of the countries surrounding the Indian Ocean and was aware of the ability of the Indian Ocean fishery resources, if rationally developed, to contribute substantially to the filling of these needs on a sustainable basis.

"Further, the Council realized the need, by developing fishing industries, and the governments in those countries, to be able to take into account the seasonal and cyclical variability in fish availability and abundance arising from temporal changes in the environment as well as from increased fishing pressure in planning the rational development of those fisheries, since local conditions of fish abundance and availability may be strongly affected by climatic and oceanographic conditions arising in the far distance and not detectable locally.

"Recognizing the necessity for a regional ocean-wide, as well as national approach to these problems into which the results of national fishery developments can be fitted and grow, the Council resolved to request FAO, in consultation with appropriate other United Nations bodies, to examine the feasibility of designing and funding a program of fishery oceanography for the Indian Ocean which would provide a regional background of knowledge and understanding of the ocean for

the use of national fishery development programs, which would make use of this sort of information arising from the International Indian Ocean Expedition and national fishery development work, and which would provide a long-range program incorporating both national and regional elements under which the rational development of the Indian Ocean fisheries could proceed expeditiously".

The Committee was made aware of that portion of the Gulf of Aden Special Fund fishery pre-investment project, under which FAO was initiating analyses by competent ocean scientists of hydrographic and biological data, arising from the IIOE and from other sources, as a preliminary phase of that project. The Committee commends this initiative and calls the attention of the Director-General to the vast amount of such data which have been collected with respect to the hydrography and biology of the Arabian Sea and also of the Bay of Bengal - Andaman Sea area, under the aegis of IIOE and through the efforts by the countries in this region to begin high seas research.

The Committee recommends that the Director-General:

(a) Implement the recommendation of IPFC in so far as this is found to be practicable, and with such timing as to expedite the working up of data as a priority;

(b) Examine the possibility of implementing a pre-investment survey involving, primarily, analyses of hydrographic and biological data of use to fisheries, in the same manner as is being arranged for the Gulf of Aden for the Arabian Sea and its gulfs as one unit, which data are arising from the IIOE.

(c) Depending upon experience and success under (b) above, initiate similar activity with respect to the Bay of Bengal - Andaman Sea area.

(d) Urge participating nations, agencies, and laboratories involved in the IIOE, to file their hydrographic, meteorological and biological data in World Data Centers with all due speed so that these analyses of data for fishery developmental purposes in the Indian Ocean countries can proceed as expeditiously and competently as possible.

The Committee appointed Dr. G.N. Mitra as Special Rapporteur on IIOE.

6.2.2 International Co-Operative Investigations of Tropical Atlantic - ICITA - and the Guinean Trawling Survey - GTS (Agenda Item 6.2 - ACMRR/3/Rec.16)

The Secretary of IOC informed the Committee of recent progress achieved in the compilation and publication of the oceanographic data collected under ICITA and the GTS. He mentioned the plans established at a recent meeting of national co-ordinators in Washington regarding the production of an ICITA oceanographic atlas, the publication of which is expected towards the end of 1966 or early in 1967. He reported that the taxonomy course, organized under UNESCO sponsorship in Abidjan, for training of African students and the sorting of material collected on the GTS, had proved very successful. The proposed symposium to review the results of ICITA and GTS and their implications for fisheries, however, had been postponed until the beginning of 1966, at the request of FAO, to allow more time for the working up of data and for budgetary reasons.

The Committee notes this progress with satisfaction and considers that ICITA and GTS are good examples of well-planned and executed international projects, having well-defined manageable objectives. The Committee took note of UNESCO's readiness to support financially the proposed symposium the results of which can be of great help to fisheries development in the area, and reconfirms its previous recommendation (ACMRR/2/Rec.19) that FAO, together with CCTA (OAU), join UNESCO in sponsoring it.

The Committee re-appoints Dr. J.N. Adjetey as Special Rapporteur on ICITA and GTS and requests him to report to its fourth session.

6.2.3 South Atlantic Co-operative Investigations - SACI (Agenda Item 6.2)

The Special Rapporteur for ACMRR on SACI summarized progress in these investigations during the past year and also gave information on other important developments in the area, particularly on the results of the second session of the South West Atlantic Regional Fisheries Commission (CARPAS). The first UNESCO training course for marine scientists in this area had taken place aboard the Brazilian research vessel "Almirante Saldanha". A meeting of Directors of Latin American laboratories on aspects of the training of marine and fishery scientists, is planned for September 1965 in Rio de Janeiro; the co-operation of FAO would be welcomed.

The Committee noted these developments, and considers it desirable that the Secretariat of IOC and FAO together examine the best possible forms of co-operation. It re-appoints Prof. F. Gneri as Special Rapporteur on SACI, and requests him to report to the next meeting.

6.2.4 Co-operative Study of Kuroshio - CSK (Agenda Item 6.2 - ACMRR/3/Rec.17)

The Secretary of IOC reviewed the main developments since the third session of the Committee. He informed the Committee that, following IOC/III/Res.5, arrangements had been made between IOC and FAO for discussion by the IPFC of the fisheries aspects of the CSK. IPFC had emphasized that fisheries programs for the CSK should be developed on a national basis and that at this stage a fisheries subject leader was not necessary. The Secretary of IOC also reported in detail on the recent, third regional meeting, in Manila, of representatives of marine science institutions in East and South East Asia, and on the first meeting of the International Co-ordination Group for the CSK at which Dr. Wadati, Japan had been appointed International Co-ordinator. The main resolutions of direct interest to fishery research deal with the preparation of catalogues and the analysis of existing data, field and laboratory testing of methods and equipment and the nomination of assistant national co-ordinators for fisheries, from among whom an Assistant International Co-ordinator for Fisheries should be selected. Assistance by FAO was requested, to provide travel expenses for him, to co-operate in the preparation of species synopses of commercial fishes in the area, and to promote improvement in collection of fishery statistics. The Manila meeting had also decided to include the South China Sea in the CSK area.

The Chief of Biology Branch assured the Committee that FAO would do its utmost to fulfill these requests.

The Committee notes with approval steps being taken to incorporate plans for fisheries research aspects in the planning stage of the CSK, but feels unable to give more detailed advice at this time on the recommendations of the Manila meeting, because insufficient notice of them had been given. It recommends that the FAO Secretariat continues to collaborate with IOC in the execution of this project.

6.2.5 Co-operative Study of the South Mediterranean - CSSM (Agenda Item 6.2 - ACMRR/3/Rec.18)

The Secretary of the IOC informed the Committee that, in accordance with recommendations of the first meeting of Directors of Marine Institutions of North Africa, convened by UNESCO in Algiers in 1964, UNESCO is considering various forms of assistance to develop activities in marine science in that area. A project for the co-operative study of the South Mediterranean is under consideration and will be discussed at a meeting of experts scheduled to take place at Split, Yugoslavia, later this year. The CIESMM has been informed of this project and its co-operation has been requested. Oceanographic research in the South Mediterranean is of particular interest because of the penetration into the Mediterranean of Atlantic waters which spread along the North African coast and the fish stocks located there.

The Secretariat brought to the attention of the Committee some other activities proceeding in the Mediterranean. The activities of the joint GFCM/CIESMM Working Party for the preparation of a Fisheries Oceanographic Synopsis of the Mediterranean were mentioned, and it has suggested that this project be brought to the attention of the participants in the Split meeting. The Committee was also informed of the recent creation of the Mediterranean Association for Marine Biology and Oceanology (MAMBO) - an international non-governmental organization - which intends to devote particular attention to training and education in marine science. Two training courses are already in preparation for summer 1965, one in Beirut the other in Malta.

The Committee took note of this information, recognizing the complex organizational situation developing in the Mediterranean, and expresses the opinion that close co-operation among existing bodies in projects of common interest would be necessary for the satisfactory development of research and fisheries in the area. The Committee requests the FAO Secretariat to follow the progress of CSSM and recommends that this proposed co-operative study be brought to the attention of the GFCM at its next session in Rome in May 1965, for consideration of its fisheries aspects.

6.3 Exchange of Data and Information (Agenda Item 6.3 - ACMRR/3/Rec.19)

A report was received from the Secretariat of IOC on progress being made with international exchange of data and information, as well as in arrangements for circulating information on "declared" programs. The SCOR Working Party on Exchange of Biological Data, on which ACMRR is represented, had given preliminary consideration to the likely problems and considered that, while it would be premature to attempt to arrange for exchange of biological data, it might still be valuable to provide a central inventory of them. With this in mind it is considering a pilot study of these possibilities, using the data accumulating from the IIOE.

Subsequent discussion concerned the valuable fisheries and biological data obtained during the GTS. The Committee reaffirms its earlier recommendation on the subject of biological data exchange (ACMRR/2/Rec.18) and recommends that Dr. F. Williams be asked to represent the Committee on the SCOR Working Party.

6.4 Second International Oceanographic Congress (Agenda Item 6.4 - ACMRR/3/Rec.20)

The UNESCO representative informed the Committee of the preparations for the Second International Oceanographic Congress which will take place in the USRR for 8 - 10 days early in May, 1966. He announced that it had been decided to establish two working groups: a Program Group to be convened by SCOR, and a Logistics Group to be convened by IOC. He drew attention to the fact that it had been decided to invite ACMRR to nominate a member to the program group, a meeting of which was scheduled to take place in Moscow in May, 1965, and FAO to nominate a member to the logistics group.

The Committee considered its representation as important in drawing up the program for the Congress with special reference to fisheries oceanographic matters, and it therefore recommends that the Director-General accept this invitation on behalf of ACMRR and appoint Dr. D.H. Cushing as its representative.

6.5 Development of National Programs (Agenda Item 6.5)

The IOC Secretary reported on action being taken by IOC in relation to IOC/III/Res.14 on the establishment and composition of its Working Group on Mutual Assistance. This subject was discussed in great detail by the Session of the IOC Bureau and Consultative Committee in Paris, Dec. 1964, which decided that the Bureau would for the time being act as the Working Group on Mutual Assistance. The Bureau will report on its activities on this matter to the June 1965 meeting of the Bureau and Consultative Committee. The IOC Secretary also gave some information on the financial scheme under which the Visiting Committee will operate; their task is, under specific national request, to review the programs and facilities in marine research of the Member States and to give them advice on these matters.

The Committee took note of the IOC action.

7. OTHER MATTERS

7.1 It was suggested that provision be made, in the Agenda of the Fourth Session of the Committee, for discussion of matters relating to the publication of text books and monographs in the field of Marine Science; this high cost was said to be an impediment to the development and efficiency of research and training in this field, especially in the developing regions, but in fact to some extent everywhere.

7.2 It was suggested and agreed that the reports and documents of the present session of the Committee be sent to its past members and that this principle be followed also in the future, so that their association with FAO be maintained. The Secretariat informed the Committee that the practice had been followed of sending to past, as well as to present members, copies of all technical documents and publications issued by FAO in the field of fisheries resources research.

ANNEX 1

AGENDA

1. Procedural matters.

   1.1 Opening of the Session.

   1.2 Adoption of the Agenda.

   1.3 Date and place of Fourth Session.

   1.4 Election of Officers for the forthcoming period of activities.

2. Implementation of recommendations of the Second Session.

3. Guide lines for future development of Fisheries Division activities.

   3.1 General aspects (12th Session of the FAO Conference - Resolution No. 8/63 on Fisheries Development).

   3.2 World Program of Marine Resources Research.

   3.3 FAO Regional Fisheries Councils and Commissions.

   3.4 Fisheries aspects of marine pollution.

   3.5 Tuna investigations and conservation (Atlantic problems; Expert Panel).

4. Fisheries Division Program of Work for 1966-67 and following biennia in the field of marine resources research and management.

   4.1 Intelligence on current activities (CBASF, Current Contents).

   4.2 Organization of Research, Education and Training (manuals; special bibliographies; study tours; symposia and seminars; training courses and fellowships).

   4.3 Meetings (future species meetings; Symposium on Tropho-dynamics of Marine Communities*; FAO Symposium on Fish Behaviour and Gear Research).

   4.4 Development and assistance in Stock Assessment (FAO Fisheries Data Center; statistics for research purposes; methods for direct estimation of fish abundance*).

   4.5 Environmental studies (fisheries oceanographic synopses; fishermen's charts and utilization of synoptic data*; booklets on oceanography and meteorology for fishermen).

   4.6 Special Fisheries Chapter of SOFA for 1967.

   4.7 Other items.

* Discussions on the basis of Progress Reports received from respective ACMRR Working Groups.

5. Coordination and cooperation with other bodies.

   5.1 UN Specialized Agencies.

   5.2 Regional Fisheries Councils and Commissions (particularly IWC and BIWS; ICES, ICNAF, etc., letters of agreement).

   5.3 ICSU (International Biological Program).

   5.4 Other matters.

6. Matters concerning the Intergovernmental Oceanographic Commission.

   6.1 General Scientific Framework for World Ocean Study.

   6.2 International Oceanographic Programs (IIOE, ICITA, SACI, CSKAR, CSSM, other programs).

   6.3 Exchange of Data and Information.

   6.4 Second International Oceanographic Congress.

   6.5 Development of National Programs.

   6.6 Other matters.

7. Other business.

8. Adjournment.

ANNEX 2

DIRECTOR-GENERAL'S OPENING ADDRESS
TO THE THIRD SESSION OF ACMRR

Chairman, Gentlemen:

It is a great pleasure for me to see you once again in FAO. There are, however, some new faces among you, showing that this Committee is keeping its vitality by introducing fresh views and varied experience from different regions of the world and from different disciplines of science.

I am sorry indeed to note the absence of one of the members nominated by the IOC, Professor G.K. Izhevsky, who recently died in Moscow. In the name of this Organization, I wish to pay a tribute to his memory and to express to his colleagues in the Soviet Union and others who have been associated with him in international activities, our deep sense of loss ..... (Silence).

At the opening meeting of last year's session, I had the opportunity to express my appreciation for the valuable work accomplished by this Committee in its first year of activity, and I would now like to renew my thanks for the advice you have subsequently given me, which has helped me in defining the policy lines and the structural changes needed for the Organization to play the leading international rôle in the field of marine resources research and utilization - which is expected by our member countries.

In line with the advice of your Second Session, I initiated a series of consultations with member nations and international organizations concerned, and the comments received were brought to the attention of the FAO Council last year at its Forty-Third Session. The Council agreed with my analysis of the situation, and accepted the conclusion that both a substantial strengthening of the Organization's fisheries activities and an improved international machinery for consultation and cooperation in fisheries, were necessary.

I have now prepared, as a supplement to my Program of Work and Budget for 1966/67, a document describing and explaining the measures I propose should be taken to achieve this goal. That document is now in your hands and it will be discussed in detail next week by an Ad Hoc Committee, which was set up by the FAO Council for this purpose.

Among the major measures I have proposed, which are inter-related and of equal importance, are the establishment of a permanent Committee on Fisheries, and the creation of a Department of Fisheries within the Organization. The functions of the new Committee would be, firstly, to review and advise me and the governing bodies of FAO on the programs of work of the Organization, and on the resources, staff and structure required to execute them; secondly, periodically to conduct general reviews of fishery problems of an international character and to suggest measures for their solution.

Although the proposed new Committee will have most important functions, I do not consider that these will diminish the importance of the work you are doing. On the contrary, not only will I continue to look to the ACMRR for advice on the formulation and execution of FAO's work on marine resources research, but I am confident that the proposed Committee will wish me to make available to it your advice on these matters. I will therefore arrange that your reports be placed before the proposed Committee on Fisheries and also that the ACMRR be made aware of any points that might be proposed raised in the new Committee on Fisheries if it is established and on which your advice would be valuable.

With my proposal for the establishment of a Department of Fisheries, and the structural reorganization and strengthening of FAO activities in this field, I expect to provide an essential framework and eventually the means to cope with the enormously

increased demand on FAO resulting from the developing situation in world fisheries. This situation is becoming more and more complex; it requires not only a rational planning for long-term development, but, in certain cases, emergency action.

Such action may, for instance, be necessary in the near future in regard to the Antarctic whale stocks, which I mentioned in my address to you in 1964. In the twelve months since this Advisory Committee last met, we have seen the International Whaling Commission fail to achieve agreement for the conservation of those severely depleted stocks, with the result that once again they will be over-exploited by the powerful whaling fleets of several nations. I therefore welcome the initiative being taken by some countries to convene an extraordinary meeting of the Whaling Commission to make another attempt to reach agreement. We hope very much this initiative succeeds. If this initiative does not succeed, I have expressed my willingness, if requested by member governments to convene, under FAO auspices, a meeting of countries concerned to try to solve this problem. We have at the same time arranged to provide the Whaling Commission, and others concerned, with an analysis of the effects of the current exploitation on the stocks, with estimates of the yields the stocks can now sustain and with suggestions regarding the action required to ensure maximum yields in the future.

The case of the Antarctic whales is important to us in its own right, as we see a large food resource being destroyed. However, what is perhaps more important, there is the danger that failure to secure rational exploitation in this one case will weaken also the international effort being developed for the purpose of managing resources of other kinds and in other regions, and may jeopardize altogether implementation of the principles embodied in the Geneva Conventions of 1958.

The need for intensive and well-planned cooperation in obtaining scientific findings on which rational management and exploitation of stocks can be based puts increasing responsibility on existing regional fisheries bodies, and in some cases, new bodies need to be established. We are working towards a solution of the problem of tuna in the Atlantic, and have also had attention drawn to growing needs in the Indian Ocean, especially in the context of the need to follow up the International Indian Ocean Expedition.

I have considered with great attention your comments and suggestions made last year on the situation of some FAO regional fisheries bodies. Now that my note on the future expansion of FAO fisheries activities is available to you, I think the Working Party that you then recommended should be established to consider these matters. I will look forward with much interest to receiving your report on this important question. The revitalization of these regional bodies might eventually imply some revision of their constitional bases in order to incorporate new principles better to reflect the spirit of the Geneva Conventions. Better support for them is contemplated in my plans for the reorganization and strengthening of the fisheries activities of this Organization.

We intend to develop an FAO Fisheries Data Centre in order to cope with the increasing need for proper arrangements for the storage and retrieval of data resulting from regional and international cooperative investigations and surveys. Such a need was recognized by the IOC, which at its 1964 Session asked FAO to form such a Centre, initially to handle material from the International Indian Ocean Expedition.

I would remind you, at this point, that execution of all these projects requires not only extensive cooperation with other Agencies of the UN, but, fundamentally, active integrated contributions from the interested countries. I have in mind particularly the broad project proposed by this Committee last year under the title "World Program of Marine Resources Research". This, from one point of view, is at present little more than a title and a definition; on the other hand many of FAO's present activities would have to be considered as elements of such a comprehensive world program. This concept, which is and has been basic to FAO's work needs to be developed and I propose to make appropriate provision in our programs of work for forthcoming biennia. We shall certainly rely heavily on this Committee, and also on the regional bodies for

guidance on this. One aspect will surely be the urgent promotion of means to make rapid surveys of resources distribution, and potential yield. A Working Party of this Committee has been active during the past year; it met here last week, and I am assured it is making progress in reviewing the present "state of the art" in this field, and determining lines of future international action. We shall also have to give careful consideration to the world-wide application of these means as they are developed. I have in mind problems of organization, of financing, and of dissemination and utilization of the results of resource surveys.

I am particularly pleased that the Advisory Committee on the Application of Science and Technology to Development, which is a committee of eminent scientific advisers to ECOSOC, has recognized the development of means for rapid marine resource surveys as one of the scientific and technical problems which merits attention with high priority by nations and by the competent UN Agencies. That Advisory Committee considered solution of this problem to be potentially of great benefit especially to developing nations.

The last point I wish to make concerns our cooperation with UNESCO and the IOC. This cooperation has continued, and indeed been extended, during the past year. I have learned with pleasure how effectively this Committee acts as an advisory body to both our organizations. We have agreed to co-sponsor with UNESCO the Second International Oceanographic Congress to be held in Leningrad in 1966. We welcome the decision of the Bureau and the Consultative Committee of the IOC to hold their next session here at FAO Headquarters. We expect also to be cooperating with UNESCO in support of another and I think potentially important venture, the International Biological Programme recently launched by the International Council of Scientific Unions.

These seem to me all to be positive steps towards the goal I have always had in mind and sought to achieve - the effective integrated action by our Agencies - the consequent benefit to our member countries and to international science as a whole. With this I wish you success in dealing with what is undoubtedly a very heavy agenda, and express, once again, my appreciation of your efforts.

ANNEX 3

OPENING STATEMENT BY MR. ROY.I. JACKSON,
DIRECTOR OF FISHERIES DIVISION,
TO THE THIRD SESSION OF ACMRR

Mr. Chairman, Gentlemen:

I think you know that I took up my new post as Director of the FAO Fisheries Division at the beginning of May last year. I should like to add to the Director-General's remarks my own welcome to you in Rome. Many of you I know well in other contexts, and I am most happy to have the opportunity to meet you again, and also to have the chance to greet new friends and colleagues.

This Committee, and especially some members of it, are rather older in direct experience of FAO matters than I. When I came here I was faced with the immediate task of preparing a long-term program of work by FAO in Fisheries. This is a consequence of a resolution by the 1963 Conference with which you are all familiar. Execution of an adequate long-term program must involve strengthening of the Organization's activities as a whole in the field of fisheries, some international reorganization, and reconsideration of the machinery for international action and FAO's role in this respect.

This Committee, both collectively and through its members individually, has had great influence in raising the question of our adequacy to carry out the tasks this Organization must now assume in the context of growing food demands, expanding sea fisheries, explosive development of marine science and ever more complex international problems. I must tell you that in preparing proposals for our future work, structure and rôle I have been very greatly helped by studying the reports and recommendations made by this Committee in its first two years of activity. You have just heard the Director-General outline the results of our deliberations. We look forward to your continued advice and assistance in the difficult task ahead of making our plans concrete, securing the cooperation of governments, institutions and scientists, and in choosing our priorities correctly.

May I, at this point, express the hope that those scientists who were members of this Committee in previous years, but who are not here now, will not only appreciate that FAO, and therefore the community of marine research workers at large, will have gained from their participation in this Committee but will feel also that they themselves have benefitted in some way from that experience and from the knowledge they now have of activities in their field by international organizations and especially by the United Nations and its specialized agencies.

Now returning to the question of choice of priorities in our work. This choice is crucial to us now and in future, and I should like to take a few minutes to explain why this is so.

The framework of our Regular Program in relation to marine resources research was developed in the Biology Branch of this Division over several years, beginning in the mid-1950s. That program was conceived as a whole in the context of a small capacity for execution and a new, growing, but not really massive, field program - the Expanded Program of Technical Assistance.

Certain elements of that Regular Program developed and produced significant results in themselves. Examples are the bibliographic service we provide and the project for reviewing knowledge of the biology of important species through the preparation of synopses and the conduct of world scientific meetings on species groups. This development was unbalanced, however, because other elements in the integral system stayed dormant and even had to be indefinitely postponed. A main reason for this was the lack of staff and funds that the Organization could provide, but we also found the

international machinery for promotion of such a program was inadequate to achieve the cooperative and concerted action needed to permit balanced growth.

About 1960 we, and others, began to pay more attention to this latter aspect, and in the following years were established the IOC under UNESCO, the ACC Sub-Committee on Oceanography, and this Advisory Committee. However, at about the same time another change occurred in UN activities - the initiation of the Special Fund Program. In recent years our need to service field operations on a massive scale has resulted in threats even to the survival of those elements of the Regular Program which had begun to prosper ; this even at a time when we knew these elements could not thrive just by remaining static but needed to continue to grow to meet new demands.

We have also said in many places and at many times that these Regular Program activities are in a very real sense the backbone of our entire work. Without them we cannot properly execute our field projects so that lasting gain is obtained from them, and this is particularly true when we consider research. Now we seem to be on the threshold of expanding staff and facilities for conduct of the Regular Program. We feel that with this we should, for example, be able to revive our work on stock assessment problems, renewing our emphasis on population dynamics and at the same time initiating important actions in relation to direct assessment methods which one of your most important Working Parties has just been considering and which we consider to be of immense potential importance, especially to developing countries. Yet, at the same time, the demands of the field program are already heavy and we shall have much difficulty in preventing these demands from drastically affecting other aspects of our future work.

The international machinery for cooperation is now better, but we still need to devote much time and energy to promoting its improvement, including the support of our present regional bodies and the possible creation of others to meet new requirements. The problems are still arising faster than we can even begin to consider them, let alone solve them. This is our present situation.

However, when the contradictions I have outlined above are resolved, I feel we must view the field projects, and especially those under the UN Special Fund, which are mainly national projects, in a broad international context. I would like to see these projects which are fundamentally for the benefit of the countries in which they are located, grow as a co-ordinated network with some regard for global as well as regional needs for marine resource appraisal. This will indeed contribute to the effectiveness of each individual project. At the same time these projects, financed in part from international sources, have inherently strong international aspects. On the one hand we need well-based national research structures to support and to make work more effectively the regional machinery such as the fisheries councils and commissions. On the other hand the existence of the national structures will itself create the need for new regional structures, without which the countries cannot solve their own problems, in view of the nature of the resources and of the modern industry. Without the machinery we could not achieve our purposes, which are, to put it simply, promotion of aiding in assessment and rational utilization of the ocean's resources through planned investment and management.

With respect to conservation and management problems, I have referred to the work on stock assessment, including biological statistics, and our contribution to bibliographic services and the documentation and information problem generally in the field of marine science and fisheries. Work on these matters is basic to our Regular Program, vital for our field programs and of very broad concern to the world community of marine scientists. These pioneering activities within FAO must grow or die. They are closely related to each other and to the new element in this field, the embryonic FAO Fisheries Data Centre. These three activities form a tripod of mutual support and you will have seen that they are brought together in the proposed departmental structure for future biennia.

Work on conservation and management in the sea is concentrated mainly on the effects that man has on resources, first in searching for them and then exploiting them. Man, however, interferes with resources and may destroy them in other ways than by fishing. I refer to the growing problem of marine pollution especially, although human activities are also beginning to affect the sea other than by polluting it. Marine pollution is not, I consider, as serious or urgent a problem as is management of exploitation at present. However, the signs are there and some countries and international organizations are giving more serious attention to the dangers and the means of avoiding them. Over recent years some action has been taken with respect to oil pollution and radioactive pollution. Now, in limited areas, we have the problem of pesticides coming in from the land and rivers, and dumping of noxious chemicals. It is not too early for us to begin to find the facts, to determine the trends and to consider what might be required eventually in the way of controls. Because we feel confident that this organization should, and will, when strengthened, be able to initiate a more active program in connection with marine pollution, the Secretary of the ACC Sub-Committee on Oceanography, who this year is a member of the Fisheries Division staff, has arranged to include this subject as a major item on the agenda of the forthcoming Session of the Sub-Committee. We shall then discuss with representatives of the other United Nations agencies concerned, ways and means to develop concerted action in which each agency can participate according to its terms of reference and fields of interest.

As a contribution to this long-term program we propose to prepare in the forthcoming biennium a scientific and technical meeting on pollution and its effects on living marine resources. The follow-up of such a meeting may eventually lead to important international arrangements for protection of the resources from pollution of all kinds and of all origins.

This brings me to the last item to which I wish to refer in these introductory remarks, and to which the Director-General has already referred - the proposed World Program of Marine Resources Research.

An active World Program would bring to reality a concept which has been basic to the work of this Division for many biennia. Now is the time to re-orient our ideas about such a program and to begin to make a more detailed formulation. We have given some thought to the instruments for carrying through such a program.

ANNEX 4

LIST OF INFORMATION PAPERS

ACMRR/3/IP.1 Statutes of the Advisory Committee on Marine Resources Research.

ACMRR/3/IP.2 Rules of Procedure of the Advisory Committee on Marine Resources Research.

ACMRR/3/IP.3 Extracts from the Provisional Report of the Forty-Third Session of the Council (FAO, Rome, 28 October 1964).

ACMRR/3/IP.4 A Fish Forecasting Service by R.E. Simmons. [Reprint from: Canadian Fisherman, 51(11), 1964, Nov.]

ACMRR/3/IP.5 SCOR - Executive Committee Meeting, June 1964 [Chron. U.G.G.I., (57), 1964].

(Sup.1) Report of the VII Meeting of SCOR, Hamburg (November 30 - December 4 1964).

ACMRR/3/IP.6 Definition and Conduct of Seminars, Development Centers, Symposia, Training Centers, etc. Prepared by FAO Fellowships Branch (in 1962).

ACMRR/3/IP.7 Intergovernmental Oceanographic Commission. Third Session. Final Report.

ACMRR/3/IP.8 COUNCIL - Forty-Third Session, Rome, 5 October 1964. Rational Utilization of Tuna Resources in the Atlantic Ocean.

ACMRR/3/IP.9 COUNCIL - Forty-Third Session, Rome, 5 October 1964. Program Activities: Fisheries Division.

ACMRR/3/IP.10 Various documents concerning FAO Manuals in Fisheries Science.

ACMRR/3/IP.11 Extracts from Summary Report of the Eleventh Session - Indo-Pacific Council, Kuala Lumpur, Malaysia (October 16-31 1964).

ACMRR/3/IP.12 Formation of the Mediterranean Association for Marine Biology and Oceanology (MAMBO). Travel Report by J.L.L. Chaux and A. Ben-Tuvia.

ACMRR/3/IP.13 Draft of a General Scientific Framework for World Ocean Study. Prepared for the IOC by SCOR (Part I) and ACMRR (Part II).

ACMRR/3/IP.14 CONFERENCE - Thirteenth Session, Rome, November 1965. The Rôle of FAO in World Fishery Development. Note by the Director-General.

ACMRR/3/IP.15 Progress Report on the Joint Working Party of GFCM/CIESMM on the Preparation of Synopses on Fisheries Aspect of Oceanography of the Mediterranean, by K. Terada and J.L.L. Chaux.

ACMRR/3/IP.16 The Application of Science and Technology to Development - Marine Fisheries Resources Aspects, by S.J. Holt, FAO Fisheries Biology Branch.

ACMRR/3/IP.17 List of Forthcoming Meetings on Marine Sciences (January 1965 - December 1965). Prepared by Fisheries Division, Biology Branch.

ACMRR/3/IP.18 ACC Sub-Committee on Oceanography - Report of the Biology Branch, Fisheries Division - For the Period 1964-65.

ACMRR/3/IP.19 Extracts from Draft Summary Report of the Meeting of the International Coordinating Group for the Cooperative Study of the Kuroshio and Adjacent Regions.

ACMRR/3/IP.20 Attendance at the Fourth Session of the Commission for Maritime Meteorology held in Geneva from 23 November to 8 December 1964. Travel Report by K. Terada.

ACMRR/3/IP.21 Intergovernmental Oceanographic Commission. Summary Report. Fourth Meeting of the Bureau and Consultative Council. (Paris, 7 - 11 December 1964).

ACMRR/3/IP.22 Various Documents concerning the Marine Aspects of the International Biological Programme.

ACMRR/3/IP.23 UN Advisory Committee on the Application of Science and Technology to Development (Membership).

ACMRR/3/IP.24 A Note on the Requirements for Emergency Action in the Present Biennium to remove the Present Backlog of CBASF, by S.J. Holt.

ANNEX 5

LIST OF WORKING PAPERS

ACMRR/3/WP.1	Provisional Agenda.
ACMRR/3/WP.2 (Rev.1)	Preliminary List of Participants.
ACMRR/3/WP.3	Synopses of Biological Data on Species of Living Aquatic Resources - A Progress Report, by H. Rosa, Jr.
ACMRR/3/WP.4	A Progress Report on the activities of the ACMRR Working Party on Symposium on Tropho-dynamics of Marine Communities, by Dr. J. Steele (Convener).
ACMRR/3/WP.5	Various Documents Concerning the ACMRR Working Party on Fishermen's Charts.
ACMRR/3/WP.6	Guinean Trawling Survey and International Cooperative Investigations in the Tropical Atlantic, by J.N.N. Adjetey.
ACMRR/3/WP.7	Progress Report on Preparation of Paper "Organization and Administration of Fisheries Research" in connection with the proposed International Conference on Fisheries Administration by FAO, Fisheries Division.
ACMRR/3/WP.8	List of Information Papers.
ACMRR/3/WP.9	List of Working Papers.
ACMRR/3/WP.10	Establishment, Structure, Functions and Activities of international Fisheries Bodies. I - Indo-Pacific Fisheries Council (IPFC), by J.E. Carroz (Legislation Research Branch) and Fisheries Biology Branch.
ACMRR/3/WP.11	Information on Existing Facsimile Environemental Chart Broadcasts, by Dr. K. Terada - Fisheries Oceanographer. FAO Fisheries Biology Branch.
ACMRR/3/WP.12	Report on the South Atlantic Cooperative Investigations carried out during the year 1964 in the CARPAS area, by Francisco S. Gneri.
ACMRR/3/WP.13	Report of the Second Session. Advisory Committee on Marine Resources Research. Rome, 6 - 12 February 1964.
ACMRR/3/WP.14	Special Fisheries Chapter of SOFA, by FAO Fisheries Division.
ACMRR/3/WP.15	Director-General's opening address to the Third Session of ACMRR.
ACMRR/3/WP.16	Statement by Mr. Roy I. Jackson, Director of Fisheries Division, to Third Session of ACMRR.
ACMRR/3/WP.17	Fisheries Education Symposium to be held at the Twelfth Session of IPFC.
ACMRR/3/WP.18	Report of the ACMRR Working Party on Direct and Speedier Estimation of Fish Abundance. (Rome 25 - 27 February 1965).
ACMRR/3/WP.19	International Marine Science, by UNESCO Office of Oceanography.

ACMRR/3/WP.20 Progress Report on the SCOR/ACMRR Working Group on Biological Data, by G. Hempel (Chairman).

ACMRR/3/WP.21 First Seminar on the Oceanography of the South Eastern Pacific, by UNESCO Office of Oceanography.

ACMRR/3/WP.22 Draft Report of the Third Session of the Advisory Committee on Marine Resources Research. Rome, 1 - 8 March 1965.

ACMRR/3/WP.23 Interaction between the World Program of Marine Resources Research and field activities for UNSF (Extracts from the Report of an ACMRR Working Party).

ANNEX 6

LIST OF PARTICIPANTS

Members of ACMRR

Mr. John N. ADJETEY	Chief Fisheries Officer Ministry of Fisheries The Castle P.O. Box 1627 Accra, Ghana
Dr. Arkadi P. ALEKSEEV*	Director, Polar Research Institute of Marine Fisheries and Oceanography Knipovichstr. 6 Murmansk U.S.S.R.
Dr. Wilbert M. CHAPMAN	President, Van Camp Foundation 739 Golden Park Avenue San Diego 6 California, U.S.A.
Prof. Walerian CIEGLEWICZ	Morski Instytut Rybacki Eleja Zjednoczenia 1 Gdynia Poland
Dr. David CUSHING	Fisheries Laboratory Lowestoft, Suffolk England
Prof. Francisco GNERI	Universidad de Buenos Aires División de Biología Animal y Vegetal Facultad de Ciencias Exactas y Naturales Calle Moreno 967, 2° Piso Buenos Aires Argentina
Prof. Yoshio HIYAMA	Fisheries Department Faculty of Agriculture Tokyo University Tokyo, Japan
Dr. Georgi K. IZHEVSKY**	All-Union Research Institute of Marine Fisheries and Oceanography Ulitsa Krasnoselskaya 17 Moscow B-140 U.S.S.R.
Dr. Geoffrey L. KESTEVEN	Assistant Chief CSIRO Division of Fisheries and Oceanography Box 21 Cronulla, New South Wales Australia

* Unable to attend.
** Deceased prior to Session.

Dr. Pieter KORRINGA	Director Rijksinstituut voor Visserij-Onderzoek Haringkade 1, P.O. 68 Ijmuiden, Netherlands
Dr. Cyril E. LUCAS	Director, Marine Laboratory Department of Agriculture and Fisheries for Scotland P.O. Box No. 101, Victoria Road Torry, Aberdeen Scotland
Mr. Donald L. McKERNAN	Director, Bureau of Commercial Fisheries Fish and Wildlife Service Department of the Interior Washington 25, D.C. U.S.A.
Dr. Gajendra N. MITRA	Fisheries Development Adviser to the Government of India Ministry of Food and Agriculture New Delhi, India
Dr. Alfred W.H. NEEDLER	Deputy Minister of Fisheries Department of Fisheries Sir Charles Tupper Building Confederation Heights Ottawa, Canada
Dr. Dietrich SAHRHAGE	Institut für Seefischerei Palmaille 9 Hamburg-Altona 1 Federal Republic of Germany

Members of ACMRR Working Group to Review Developments in Direct and Speedier Estimation of Fish Abundance

Mr. Basil B. PARRISH (Convener)	Senior Principal Scientific Officer Marine Laboratory Department of Agriculture and Fisheries for Scotland P.O. Box No. 101, Victoria Road Torry, Aberdeen Scotland
Dr. David CUSHING	
Mr. Lars S. MIDTTUN*	Oceanographer Fiskeridirektoratets Havsforskningsinstitutt Oseanografisk Avdeling Bergen Norway

* Attended only the Working Party.

Representatives and Observers of International Organizations

UNESCO AND IOC

Dr. K.N. FEDOROV (Secretary of IOC)	Director Office of Oceanography UNESCO 2 Place de Fontenoy Paris 7e France

UNESCO

Dr. G. HEMPEL	Program Officer Office of Oceanography UNESCO 2 Place de Fontenoy Paris 7e France

UNSF

Dr. H. Kasahara*	Project Officer, Fisheries UN Special Fund New York U.S.A.

SCOR

Dr. THAM AH KOW	Fisheries Biology Unit University of Singapore Bukit Timah Road Singapore 10 Malaysia

SCIBP

Dr. R.S. GLOVER**	P.M. Sectional Committee Scottish Marine Biological Association Oceanographic Laboratory Craighall Road 78 Edinburgh 6 Scotland

ICSU

Mr. F.W. BAKER** (Secretary of SCIBP)	Scientific Secretary ICSU 2 Via Sebenico Rome Italy

* Attended only discussions on the Rôle of FAO in World Fishery Development.
** Attended only discussions on IBP.

Food and Agriculture Organization

Dr. B.R. SEN	Director-General
Mr. R.I. JACKSON	Director, Fisheries Division
Mr. F.E. POPPER	Deputy Director, Fisheries Division
Mr. S.J. HOLT	Chief, Fisheries Biology Branch
Dr. M. RUIVO	Chief, Research Programs Section Fisheries Biology Branch
Mr. E.F. AKYUZ	Biologist, Research Programs Section Fisheries Biology Branch
Mr. H. ROSA, Jr.	Chief, Marine Resources Section Fisheries Biology Branch
Dr. K. TERADA	Fisheries Oceanographer Fisheries Biology Branch
Mr. C. BEEVER	Acting Chief Fisheries Economics Branch
Mr. L.P.D. GERTENBACH	Chief, Statistics Section Fisheries Economics Branch

Other staff members attended for discussions on certain items.

Officers during the Third Period of Activities of the Committee up to and including the Third Session

Chairman	Dr. A.W.H. NEEDLER
Vice-Chairman and Rapporteur	Dr. C.E. LUCAS
Vice-Chairman	Mr. D.L. McKERNAN

Secretariat of the Committee

Secretary:	Dr. M. RUIVO
Administrative Assistant:	Miss C. de FREITAS
Assistant:	Miss S. de Friston

ANNEX 7

INTERACTION BETWEEN THE WORLD PROGRAM OF MARINE RESOURCES RESEARCH AND FIELD ACTIVITIES FOR UNSF

The impact of the field activities under UNSF is considerable and of two kinds:

(1) As a work load on the staff,

(2) As a strengthening of the Regular Program.

"Impact" as Work Load

Activities under the Regular Program usually relate to subjects and have an essentially global character, even if at times they deal with particular regional or even national instances. In contrast, the field program activities are regional and national, relate strictly to projects and servicing of these projects has been chiefly managerial. Despite the technical content of these projects they only rarely - or in the long-run, and then indirectly - have contributed to the development of the global subject matter.

Field projects should be seen as having in most senses the same relations as established national and intergovernmental activites to the Regular Program: in that they draw on the services provided by the Regular Program although because of their nature their demand is heavier and unpredictable and it commands a readier attention. Nevertheless, however urgent their need might be, they should not be able to reduce the effectiveness of the Regular Program that it should be in danger of being unable to meet proficiently either the regular or the special demands.

The logical consequence of this argument is that staff should be employed to perform these duties required by the aid programs, that cannot be performed by the Regular Program staff in the course of their assigned Regular Program duties.

Whilst it is important to ensure that at any time the complement of field projects is matched by a sufficient and effective non-project staff, it is also necessary to ensure that the activities of that staff maintain a high level of efficiency so that the complement of field projects should be as strong as possible. Achievement of this objective calls for strong management measures with regard to initiation, preparation and servicing of projects.

The Working Party believes that much more should be done to assist countries, the UNSF and TAB, in the identification of opportunities for effective field projects and in their formulation.

It is also the view of the Working Party that projects have been undertaken without sufficient critical scrutiny of the arguments for them and of the plans for their conduct, and moreover that the field operations of many projects are begun much too quickly, before the necessary minimum of staff and equipment required for them is ready. In the first place fullest use should be made of all existing information with regard to any developmental matter for which an aid project is to be launched. This is especially true with regard to the research projects with which Biology Branch is concerned. Data concerning temporal changes in oceanic features directly influencing the abundance and accessibility of fishery resources are being accumulated in quantities through numerous ocean research projects, and agencies, many of which are operating for purposes other than fisheries development. It seems certain that the rate of accumulation of such data will continue to increase for some years and it seems obvious

---

Extracts from the Report of a Working Party consisting of G.L. Kesteven (Convener), J. Adjetey, W.M. Chapman, D.H. Cushing, G. Mitra; the Rapporteur, M.J. Girard, S.J. Holt and J.O. Traung also participated.

that special arrangements should be made to take every advantage of such data in planning and carrying out Special Fund projects.

The Working Party suggests that steps should be taken to establish formal and continuing arrangements for gaining access to and making fullest use of both the existing body of oceanographic and fisheries data and new data as they accumulate. (The Working Party noted with appreciation the arrangements being contemplated in this sense with regard to the Aden Project). The Working Party points out that effective use of this material will have considerable influence on the plans for Special Fund projects especially the choice of lines of study to be engaged in these projects.

One of the major problems in making aid projects fully effective derives from the lack of local staff to act in counterpart capacity. The Working Party believes that in many cases the initiation of a project should be preceded by a special training program and that, if necessary, initiation of a project should be postponed until the counterpart staff required are trained and ready to take their part in the project. In some cases this might be accomplished during the period when available oceanographic and biological data are being gathered together and analysed.

Similarly, the field work of projects should not be initiated until detailed scientific work schedules have been formulated with regard to that work and the equipment and accomodation for them are available. This is not to say that no project should be begun until all of its equipment and accommodation is available, but that no field operations should be undertaken without the equipment and accommodation necessary for fully effective work. In this connection, it should be noted that the research vessel is often the fishery scientist's most important tool, and that its design, construction and outfitting is a time-consuming process.

For most of the projects with which the Biology Branch is concerned, a considerable amount of servicing by Head Office staff is required, particularly because marine resource assessment is essentially a scientific activity and the field staff concerned are therefore required in effect to conduct research at a high intellectual level and with the most modern techniques, yet often without the necessary general scientific support and background in the country of the project. This consists of prior documentation of the project, briefing the experts, maintaining contact with them during the project in order to advise and to provide literature and assistance in technical matters, and finally, of assisting them in the interpretation of their results and the preparation of their reports. All this is quite beyond the capacity of the present biological staff of the Fisheries Division, both at present and even with the degree of Regular Program strengthening proposed for the next three biennia.

"Impact" as a Strengthening

In this regard the Working Party sees the problem as being one of seeking means to maximise the benefits to be obtained from the aid programs in strengthening the Organization program as a whole seeking to improve world food and agriculture. Each aid project increases the range of fisheries activities in the world and adds to the general body of trained personnel able to participate in fisheries work, including of course, work on the international aspects. It promotes development of institutional structure and in this and other ways extends the influence of the Organization. So far as the staff is concerned, development of these aspects ensures the worthwhileness of the workload they have to carry. It helps to increase efficiency in the discharge of their task while increasing the feedback workload to the Regular Program. In order to maximize the value of these projects in these senses, steps should be taken, in the view of the Committee, firstly to ensure the highest possible scientific content of each project and, secondly, to develop exchanges between the projects.

Scientific Content

The field projects with which the Biology Branch is concerned are engaged in the study of fisheries resources. The objective of these studies may be stated in fairly simple terms and may be expected to lead to important economic development. The effective prosecution of the planned research requires the availability of some threshold value of staff and equipment and that the technical details of the plans should be designed carefully to the objectives. The Committee is under the impression that in a number of projects the staff provided is quite inadequate for the purposes specified. The studies in these projects in many instances encompass extensive exploratory and prospecting fishing operations. The size of the scientific staff required to carry out these operations should be determined by a realistic estimate of the size and duration of the exploratory and prospecting fishing operations required for the proper assessment of the resources. These operations should always be planned and directed by the scientific staff of the project.

Particular reference may be made here to the matter of the research vessels for these projects, both vessels engaged in prospecting and those engaged in more fundamental studies of the seas. A research vessel is generally the most expensive item of any marine research program and therefore very careful consideration should be given to ensuring that the vessel is suitable for the task for which it is required. It is not possible to lay down specifications for an ideal vessel to serve all types of research but certain minimum requirements might be formulated.

Coordination

The intrinsic value of each field project and of its contribution to knowledge of world fisheries could be significantly increased by more positive and deliberate steps to coordinate these projects. Certain measures of standardization of techniques and exchange of information which are a feature of Regular Program activities should be incorporated in all field projects and obviously, considering the important role played by the Organization in these aid programs, the Organization has in these a special opportunity to promote its own principles. The projects should coordinate with other activities by other entities engaged in marine research programs to the extent that this does not interfere with the objectives of the projects.

ANNEX 8

REMARKS BY THE RETIRING CHAIRMAN, DR. A. NEEDLER

I have seldom had as pleasant and rewarding an experience as being Chairman of this Committee. The contacts are broad, and very various, and I have certainly enjoyed it. I am very glad that Mr. Jackson has made the suggestion that there be a status, as it were, of "ACMRR Emeritus". I think it is good for the Committee to try to keep contact with its former members who, I am sure, will not only benefit themselves but also be interested in furthering the aims of the Committee.

I would go a little further than Mr. Jackson, who said that there might be controversy in the Committee but all directed to the same objective. Perhaps not even the broad objective is the same for all members. A committee of this sort thrives on controversy; that is what it needs. If the time came when the ACMRR had no controversy, that would be the time to disband it. One of the values of this Committee - members of which are volunteers having no firm commitments to the FAO Organization, either financial or in any other way, who are people with careers mainly based on some other organization - is that the experts on it can speak frankly. Such a body can say what it thinks should be said. I think that firmness of opinion is necessary for the health of the Committee, for eliciting suggestions from its members which will keep the Committee productive. There is now another fisheries committee in embryo - or at some stage in the productive process - and I think that such a committee would result in an alteration of the work of the ACMRR to some degree. We have as a matter of fact regarded our terms of reference very broadly. We may sometimes have gone outside the letter of these terms of reference, but this has been a good thing. I think that we may have been responsible in part for the improvement of the resources of the FAO in the fisheries field which may now be taking place. Perhaps in that connection we stretched our terms of reference. Perhaps now there will not be occasion or need to do this sort of thing, but I would urge the Committee to say what it thinks with courage and freedom.

I would like in closing to express my appreciation to you all for the very pleasant relationships of the past three years. I would like to join Mr. Jackson in commending the staff of the Fisheries Division, both for their ability and for their dedication. And I would like last, but by no means least, to express our appreciation for the really wonderful work which has been done, especially at the close of our meetings, by the girls of the Secretariat. I know they have worked well into the early hours of the morning, and they have done a good job.

ANNEX 9

STATEMENT BY THE REPRESENTATIVE OF UNESCO/IOC, DR. G. HEMPEL

The difficulties in finance and manpower in the Biology Branch of FAO and in the IOC Secretariat limit the extent of cooperation between these two Secretariats which have much in common in their aims and means, especially in the field of marine biology.

In the Statutes of the Intergovernmental Oceanographic Commission it is said that IOC should promote scientific investigations about nature and resources of the oceans and that the IOC Secretariat shall cooperate actively with the Secretariats of FAO and other agencies. As the marine biologist in the IOC Secretariat, I regard it as one of my special objectives to tie together programmes on academic lines of biological oceanography with research into marine resources. It is in this respect that we regard the rôle of ACMRR as very important in furthering the collaboration between the two Secretariats.

It is a rather common opinion that the large programmes conducted by IOC tend to be sophisticated enterprises of physical oceanographers of leading nations in oceanography and that their impact on marine resources research is restricted. We know that this is not quite so. We have heard about the Gulf of Aden project which is based on the results of the International Indian Ocean Expedition and you have appreciated the very stimulating effect of the IIOE and ICITA on the development of marine science - academic and applied - in various countries.

A nucleus of worry remains, however, and I blame myself, as a former member of the ACMRR, for not having looked sufficiently into the potentialities of these programmes. Two examples may be given:

The seasonal, partly monthly or bi-monthly, work on sections in the Kuroshio and adjacent waters offer the opportunity to understand better the biological reasons for the fluctuations in abundance of fish stocks. It might permit also the quantitative study of some elements of the food chain and their interaction. The planning for those investigations - although regional by nature - would gain by assistance and stimulation from bodies like ACMRR. This might also help to overcome national rivalries which limit optimum planning and conduct of research and communication. I hope very much that FAO will try its best to encourage resources research during such programmes as the CSK by financial and scientific assistance in planning and in coordination with regional and national programmes in fisheries research.

Another potentiality of the large programmes is that research vessels of industrialized countries are going into the region of developing countries. Arranged on a bilateral or international basis, shipboard fellowships provide young scientists of developing countries with the opportunity of training in their home waters. The developing countries can also make use of the frequent port calls of foreign research vessels by making scientific visitors familiar with the local opportunities, programmes and problems of research which, in developing countries, are far more devoted to the living resources than in the industrialized countries.

UNESCO, through the IOC, is not only the promoter of "mammoth" expeditions, but works also in other fields which have a direct or indirect impact on marine resources research. It assists SCOR in its work on standardization of methods and is interested in data exchange and other means of communication. Close cooperation in the planning of seminars in various fields of marine science is urgently needed and ACMRR may play a very important part in this work in order to make the best use of scientists and the means available for the meetings.

---

* An edited version of statement delivered to the Committee at its closing meeting.

The enormous increase in research projects in all parts of the world makes training of young oceanographers a pressing need for the years to come. Careful consideration of ways for more and better training might be one of the most important tasks of ACMRR. Training programmes should in general not be established on a world-wide but on a regional basis. The fact that ACMRR members come from all parts of the world and have close contacts with regional bodies ensures competent advice on exchange programmes, textbooks, shipboard fellowships and other matters on which we may seek their consultation. Reports like those by Dr. Adjetey and Professor Gneri on regional activities in marine research are very valuable and the example might be followed for other regions.

The fact that scientists and not administrators are the officers of FAO Biology Branch and the UNESCO Office of Oceanography, facilitates communication between the two Secretariats and between them and the ACMRR members, and it is our sincere hope that, after the organizational problems of FAO have been settled, ACMRR may be able to concentrate more on the discussion and advice on needs and conduct of research into marine resources.

Marine biology has been challenged by various powers:

- the outburst of abiotic oceanography
- the development of oceanic fisheries
- the need and interest of tropical and sub-tropical countries to develop their fisheries
- the establishment of the International Biological Programme

I think we have to accept this challenge. The Office of Oceanography of UNESCO tries its best to assist marine biology as an integrated part of the development of marine science and ACMRR, as an advisory body to FAO and IOC, will play an important rôle for sound and well-balanced progress in marine biology.

NAMES AND ABBREVIATIONS OF ORGANIZATIONS AND PUBLICATIONS REFERRED TO IN THIS REPORT

ACC - Administrative Committee on Coordination (ECOSOC)

ACMRR - Advisory Committee on Marine Resources Research (of FAO)

CARPAS - Comision Asesora Regional de Pesca para el Atlantico Sudoccidental

CBASF - "Current Bibliography for Aquatic Sciences and Fisheries"

CCTA - Commission for Technical Cooperation in Africa South of the Sahara (see SCTR)

CIESMM - International Commission for the Scientific Exploration of the Mediterranean Sea

CMM - Commission for Maritime Meteorology (of WMO)

CSK - Cooperative Study of the Kuroshio

CSSM - Cooperative Study of the South Mediterranean

ECLA - Economic Commission for Latin America (of UN)

ECOSOC - Economic and Social Council (of UN)

EIFAC - European Inland Fisheries Advisory Commission (FAO)

EPTA - Expanded Program of Technical Assistance (of UN)

FAO - Food and Agriculture Organization of the United Nations

GFCM - General Fisheries Council for the Mediterranean (FAO)

GTS - Guinean Trawling Survey (under CCTA)

IAEA - International Atomic Energy Agency

ICES - International Council for the Exploration of the Sea

ICITA - International Cooperative Investigations of the Tropical Atlantic

ICNAF - International Commission for the Northwest Atlantic Fisheries

ICSU - International Council of Scientific Unions

IIOE - International Indian Ocean Expedition

IMCO - Inter-governmental Maritime Consultative Organization

IMS - "International Marine Science"

IOC - Inter-governmental Oceanographic Commission (under UNESCO)

IPFC - Indo-Pacific Fisheries Council (FAO)

MAMBO - Mediterranean Association for Marine Biology and Oceanology

NODC - National Oceanographic Data Center (U.S.A.)

OUA - Organization of African Unity

SACI - South Atlantic Co-operative Investigations

SCIBP - Special Committee for the International Biological Program (of ICSU)

" (PM) Sectional Committee on the Productivity of Marine Communities

SCOR - Scientific Committee on Oceanic Research (of ICSU)

SCTR - Scientific Commission for Techniques and Research (of OAU)

SOFA - "State of Food and Agriculture"

UNESCO - United Nations Educational Scientific and Cultural Organization

UNSF - United Nations Special Fund

WMO - World Meteorological Organization

25842/6.65/E/1/750